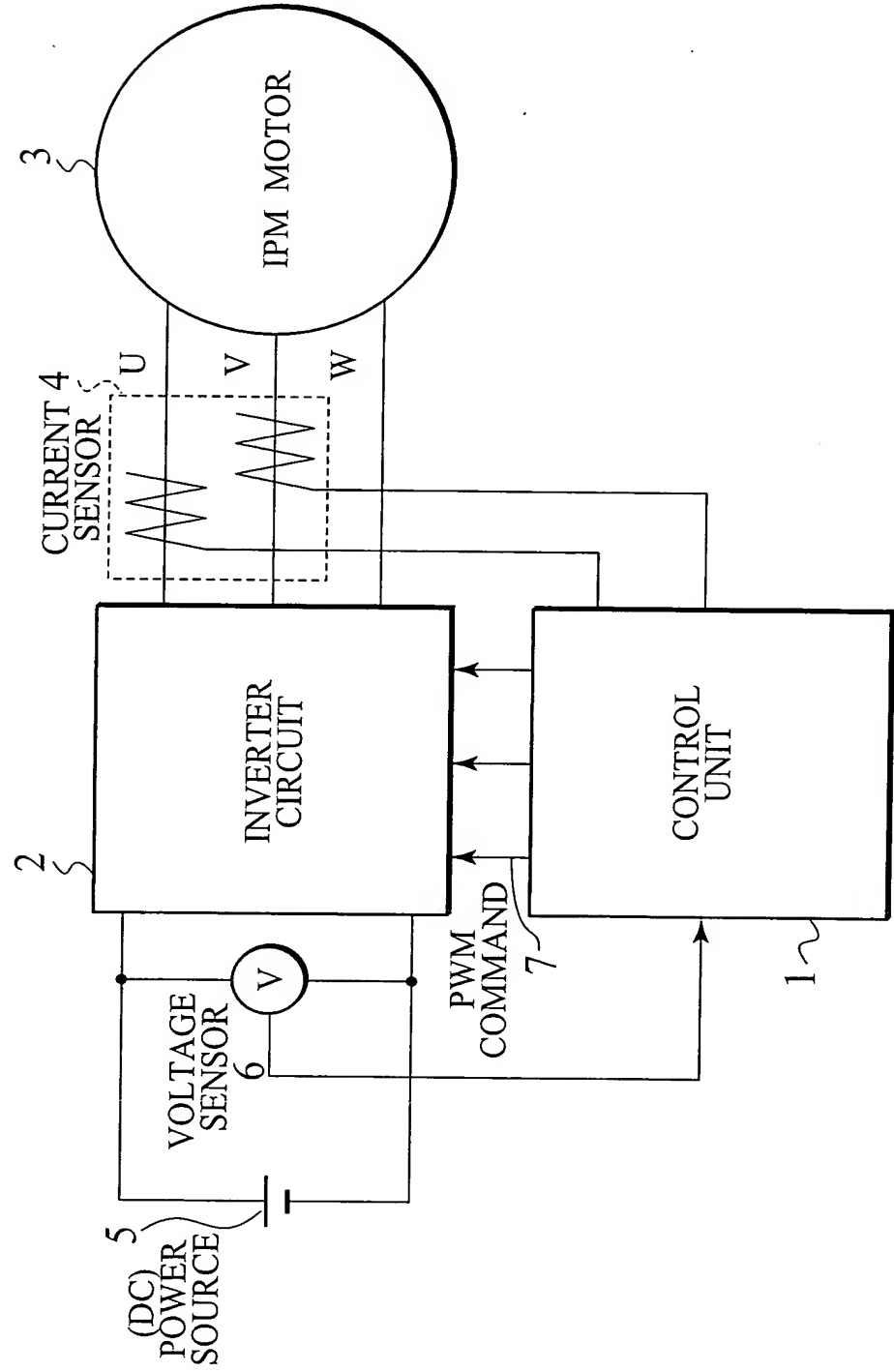


FIG. 1



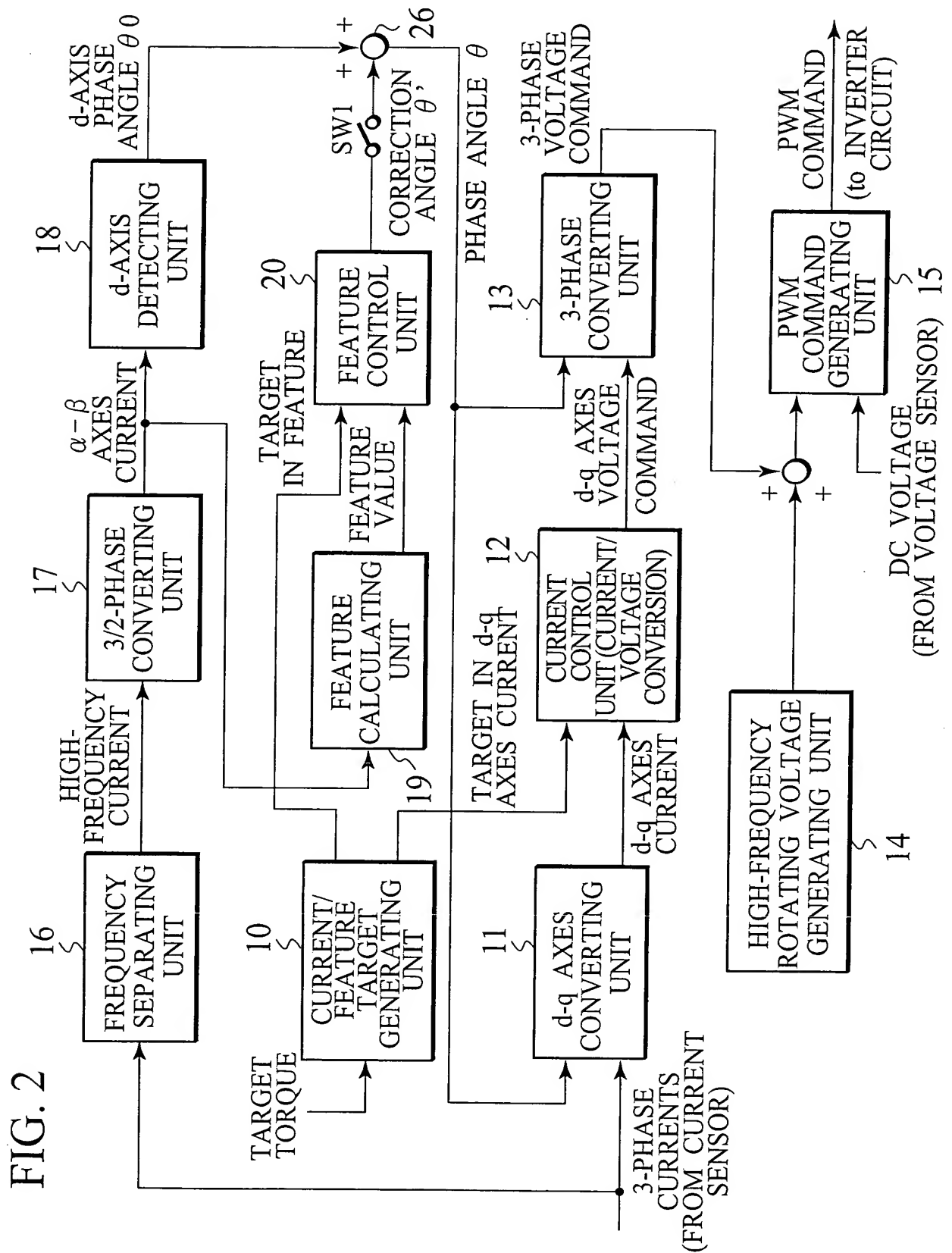


FIG. 3B

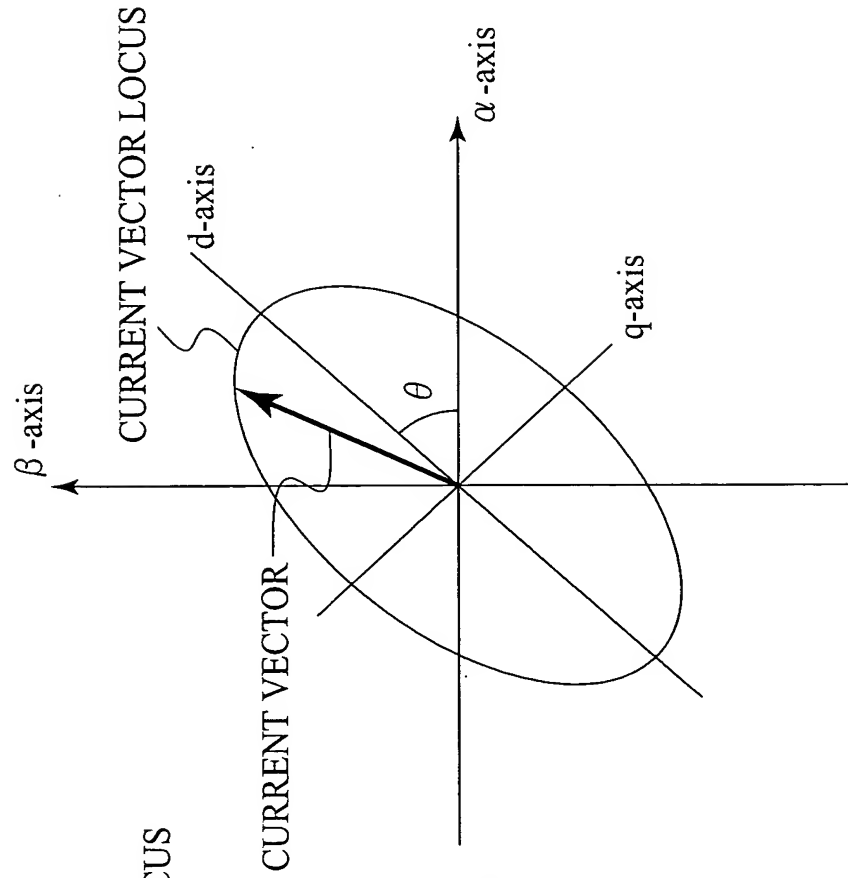
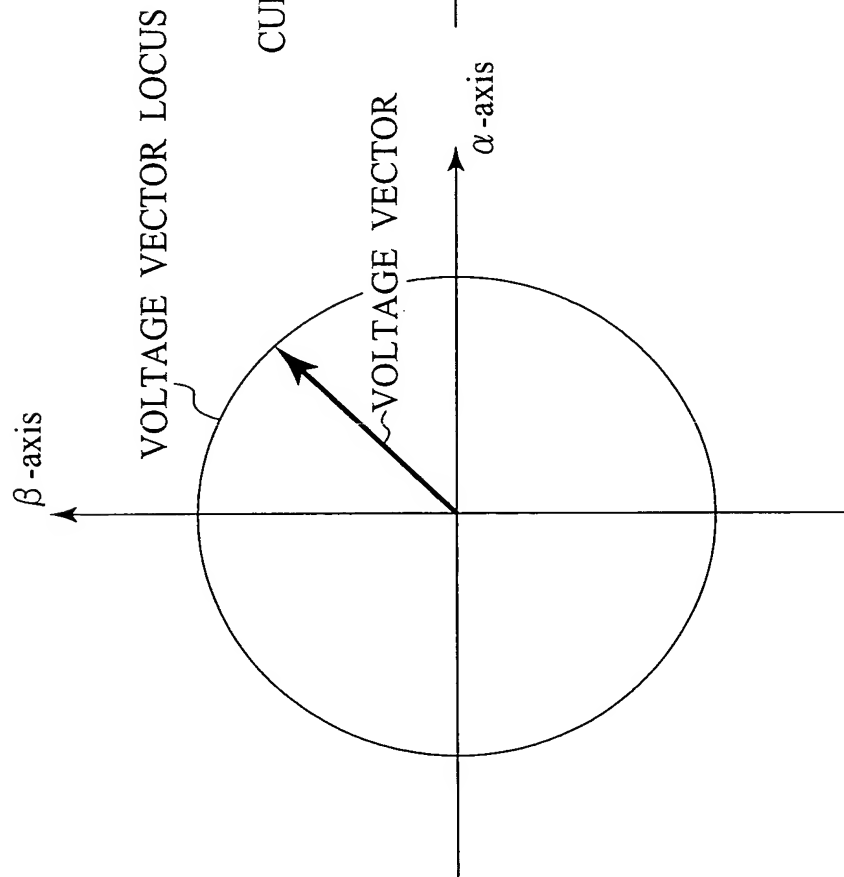


FIG. 3A



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FIG. 4A

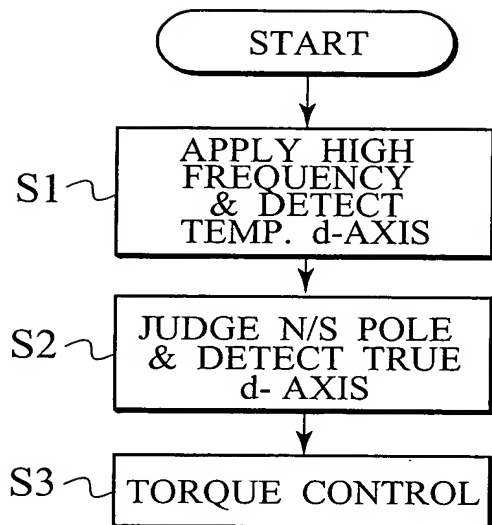
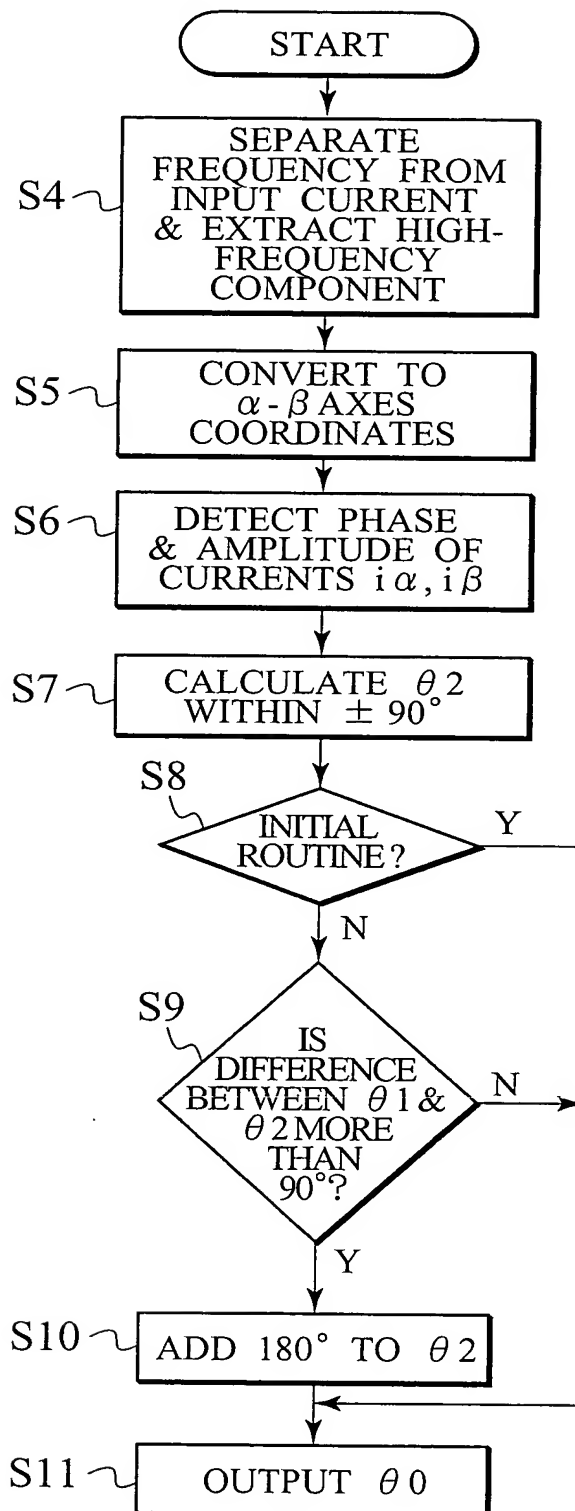
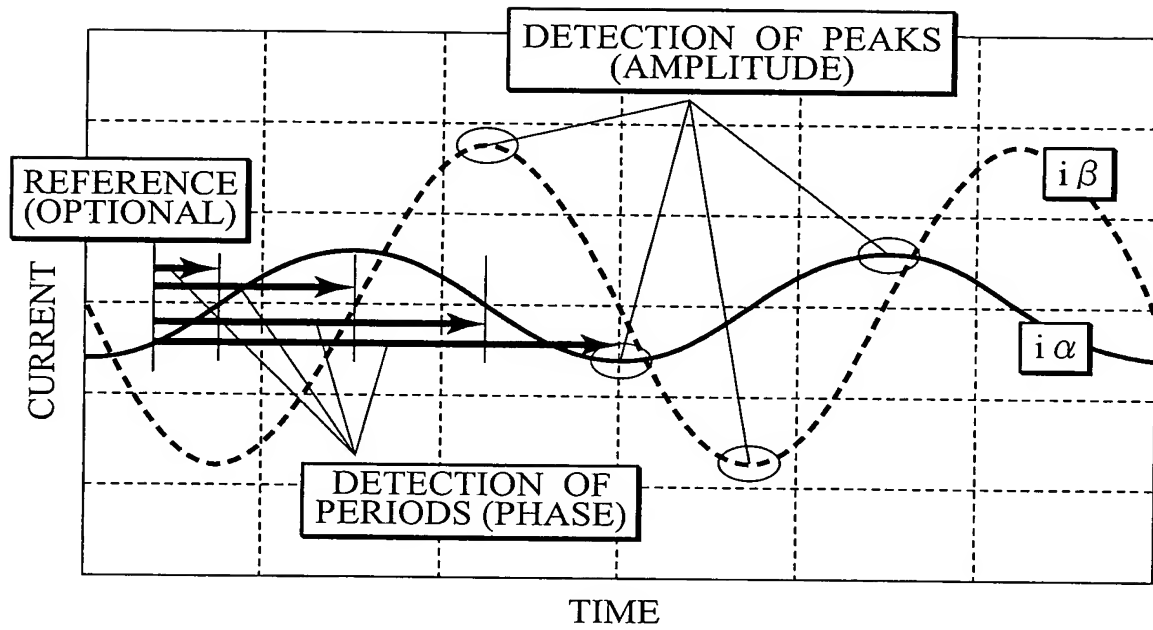


FIG. 4B



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FIG. 5



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FIG. 6

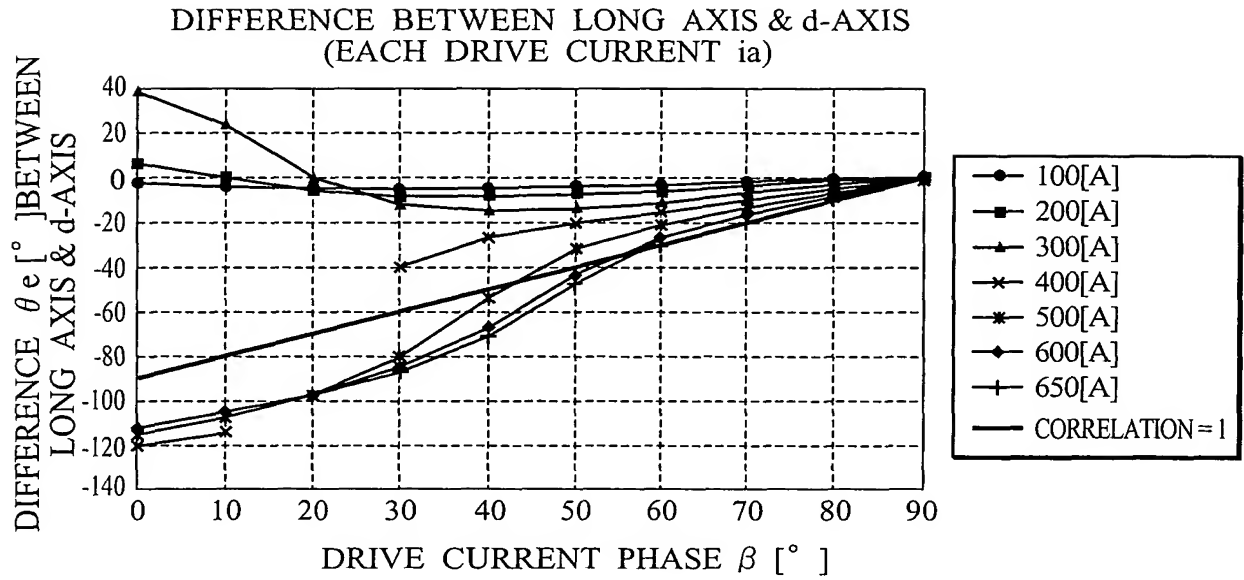
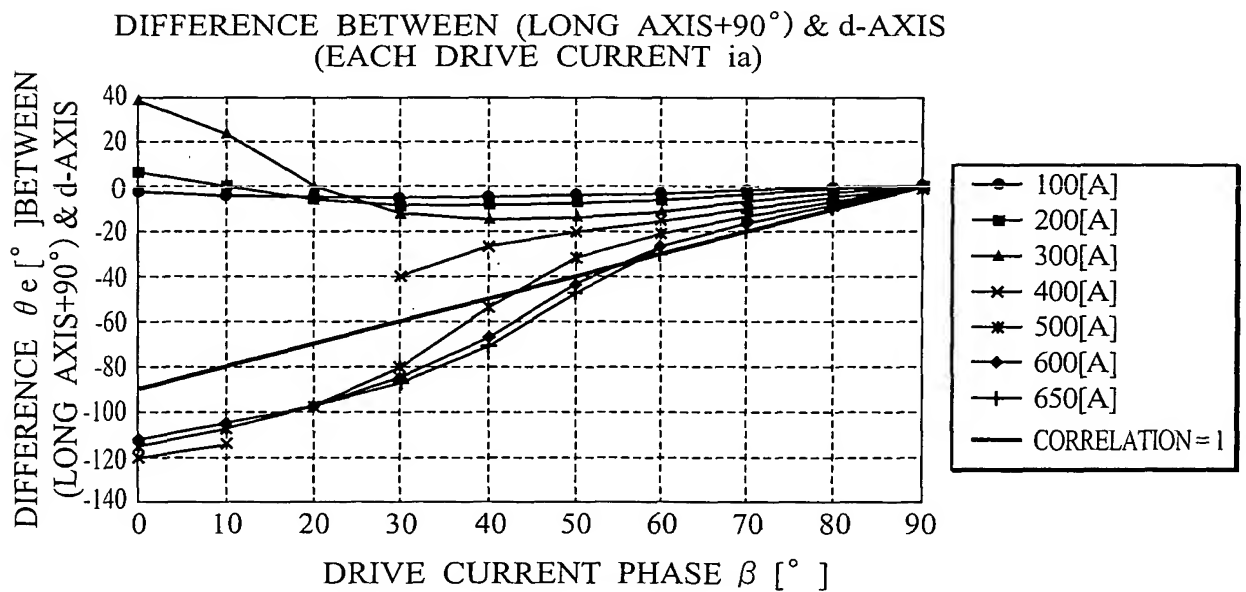


FIG. 7



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FIG. 8

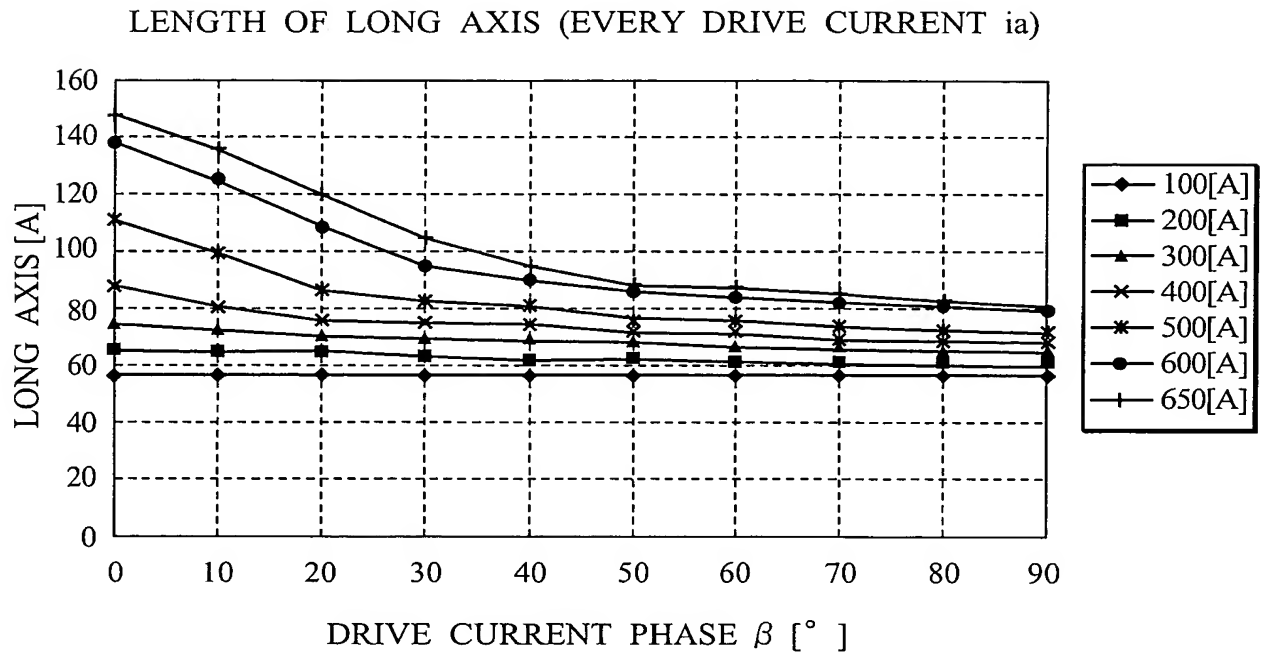
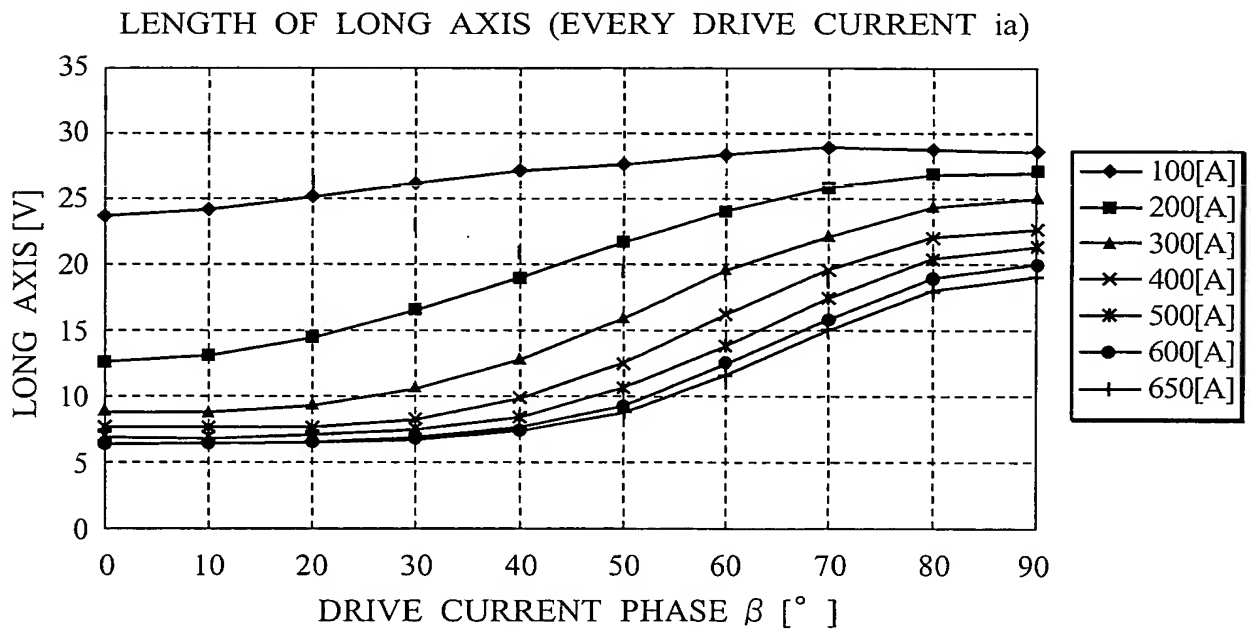


FIG. 9



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FIG. 10

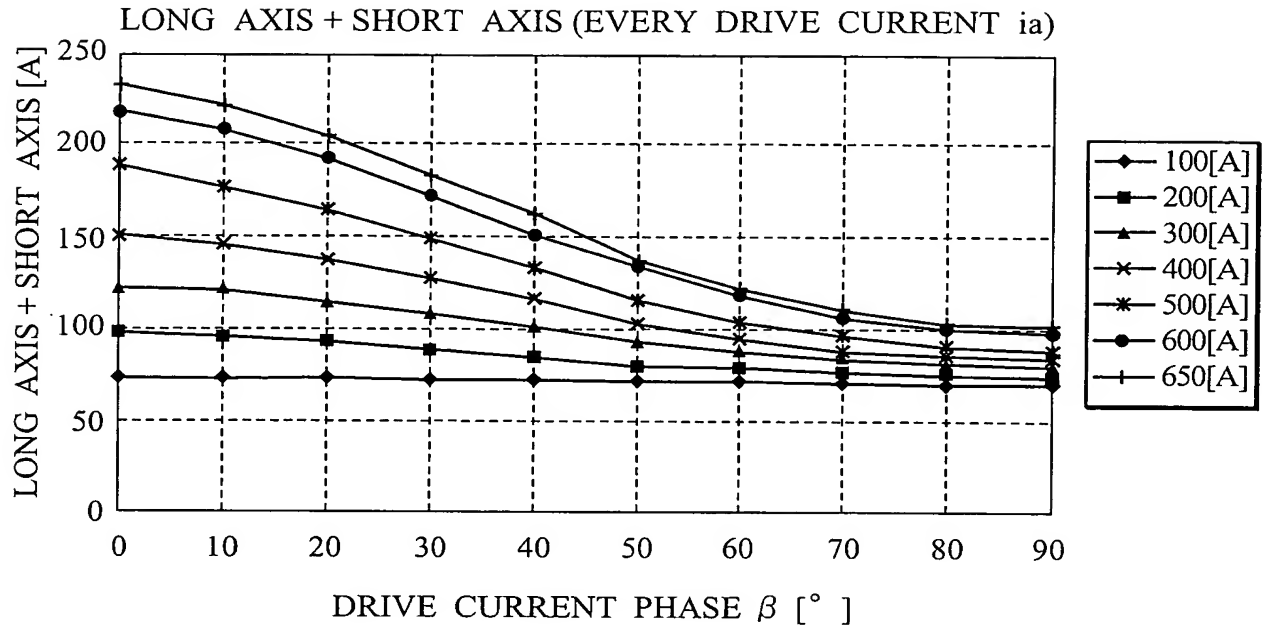
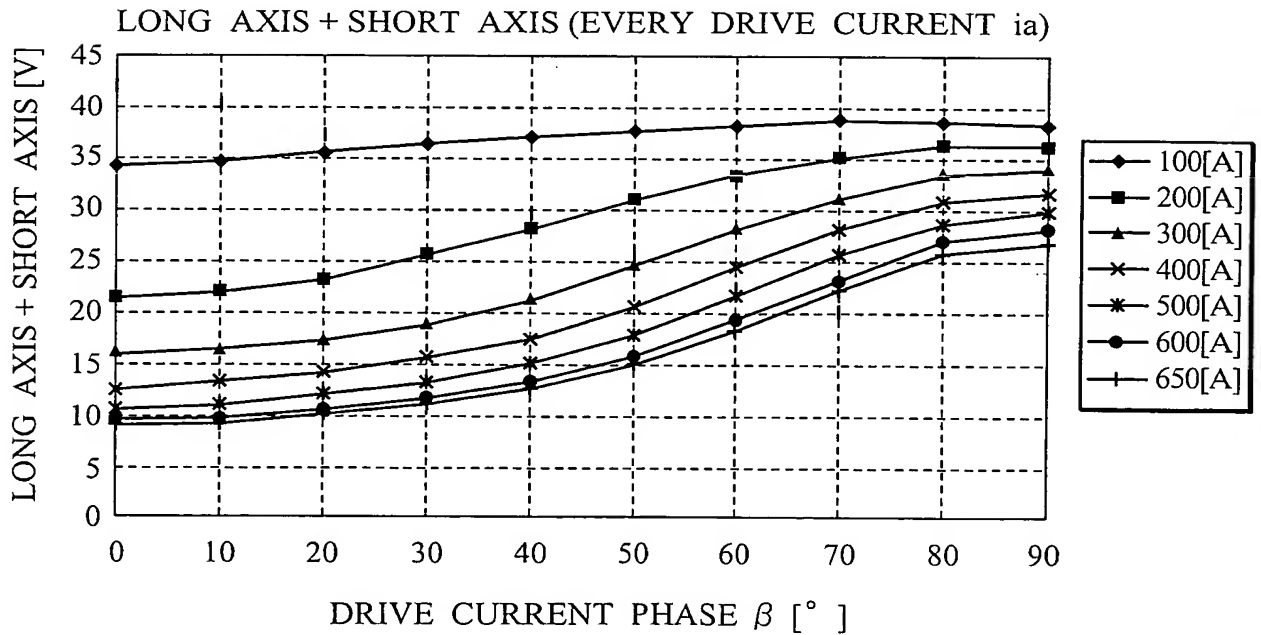


FIG. 11



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FIG. 12

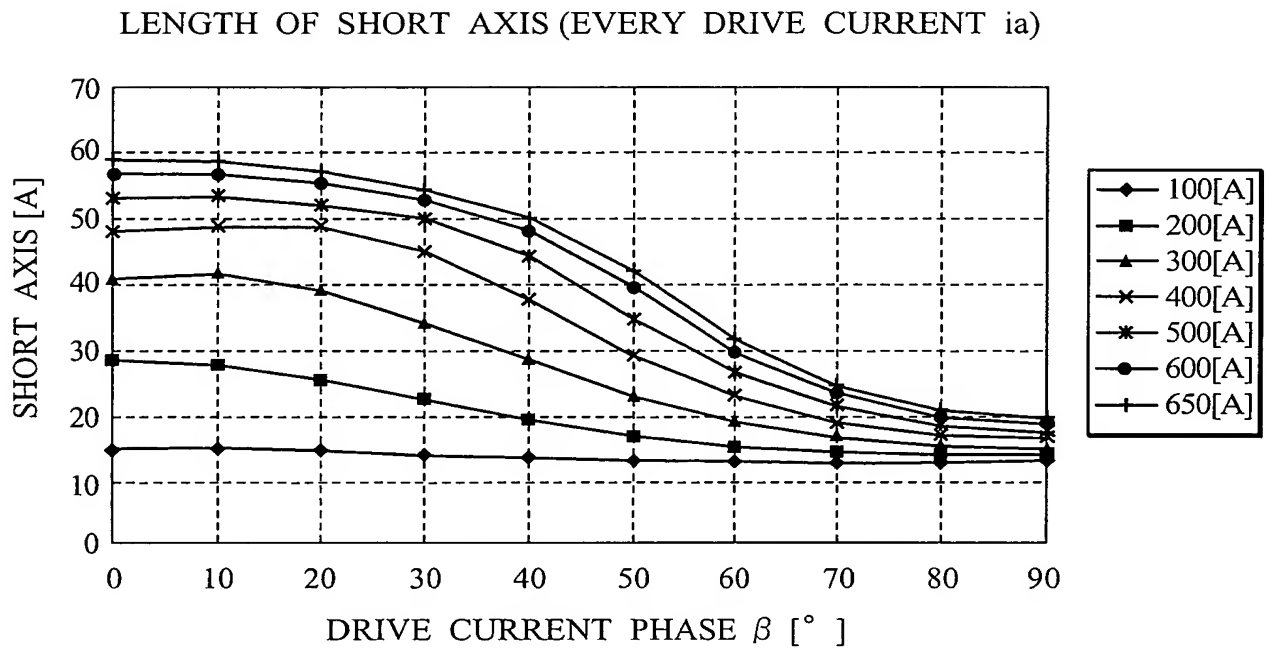
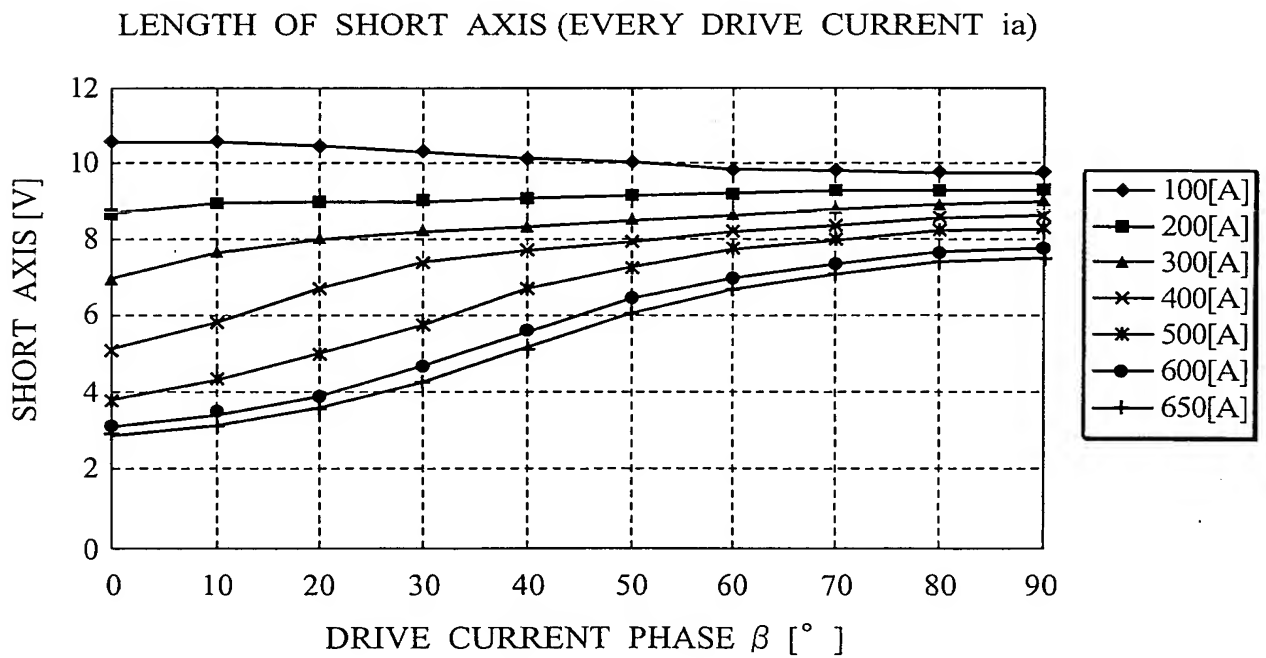


FIG. 13



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FIG. 14

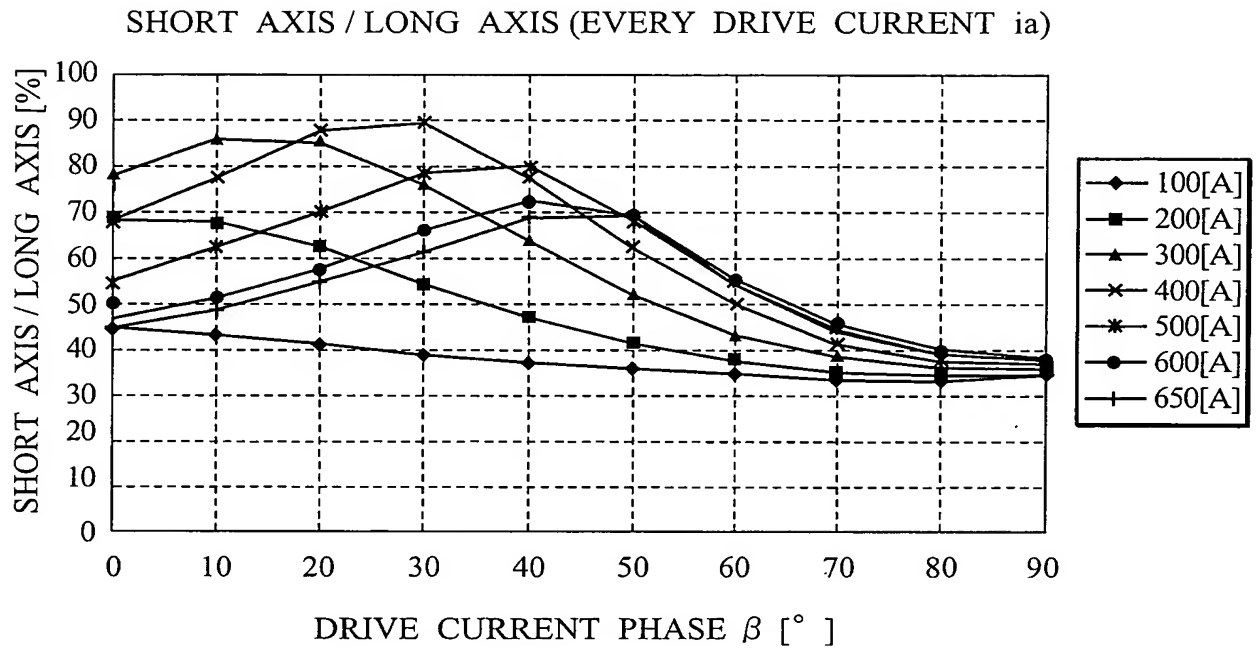
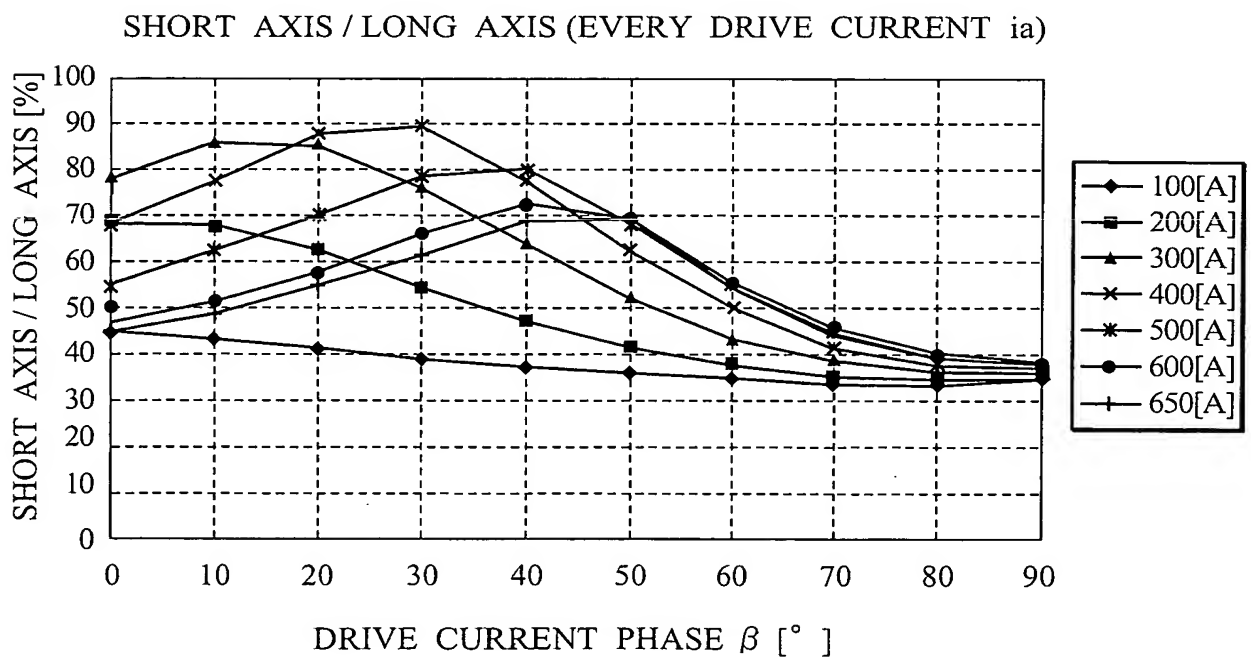


FIG. 15



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FIG. 16

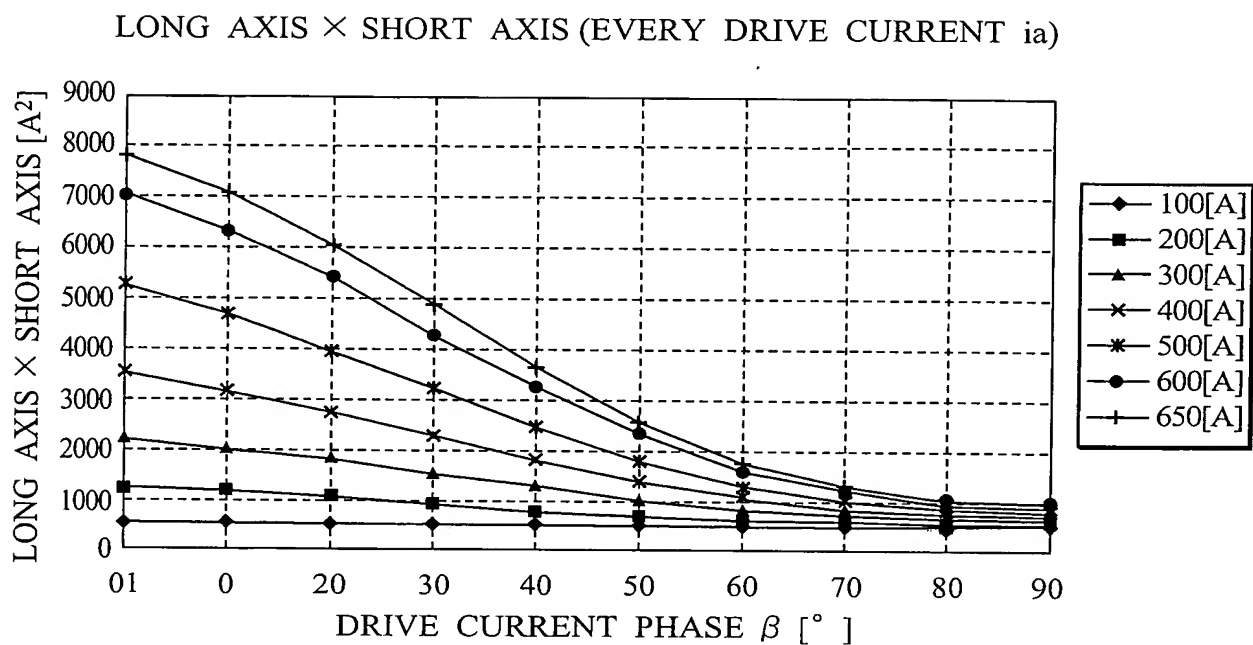
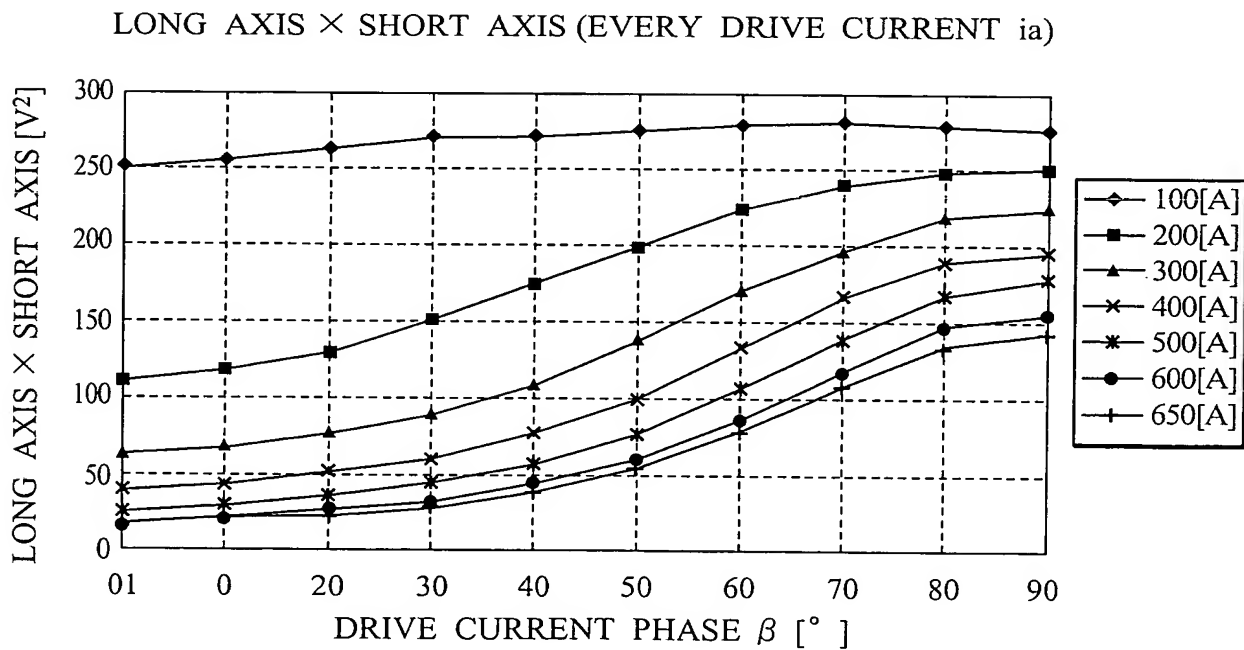


FIG. 17



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FIG. 18

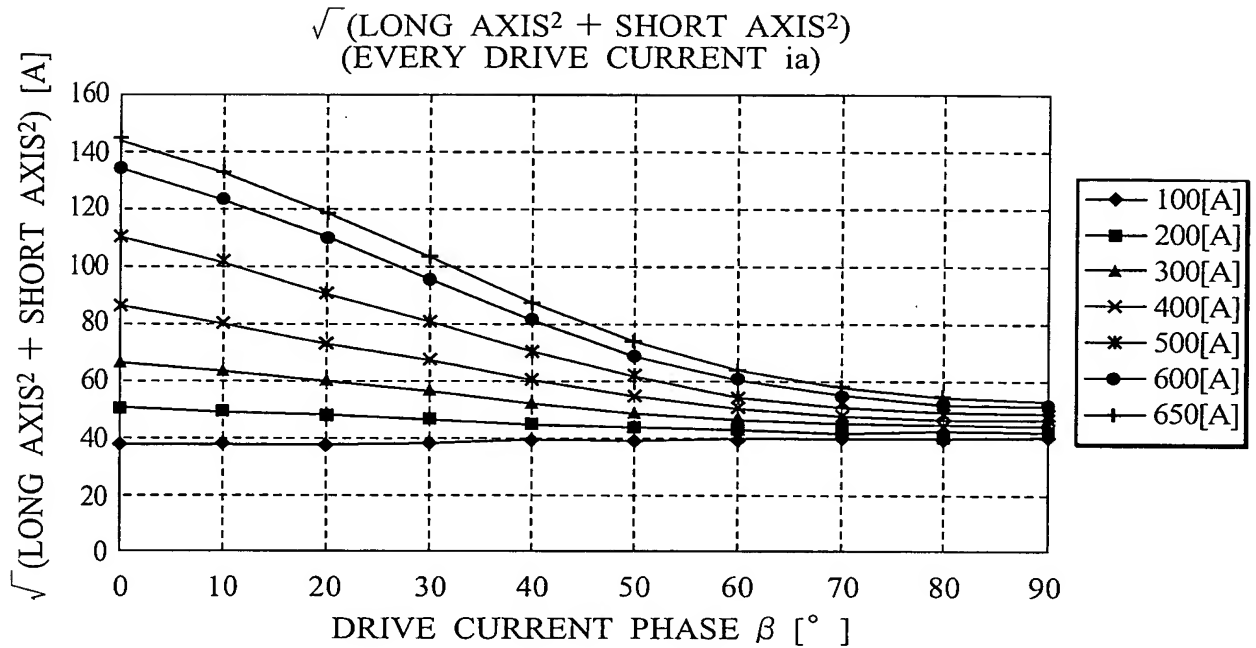
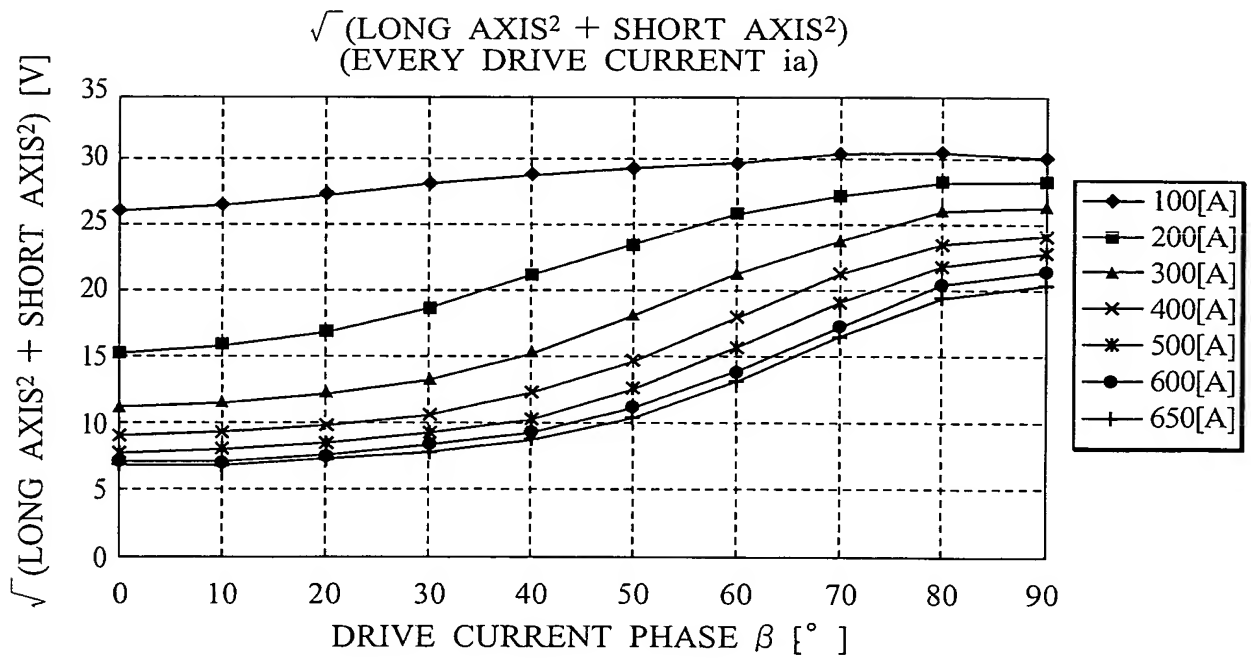


FIG. 19



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FIG. 20

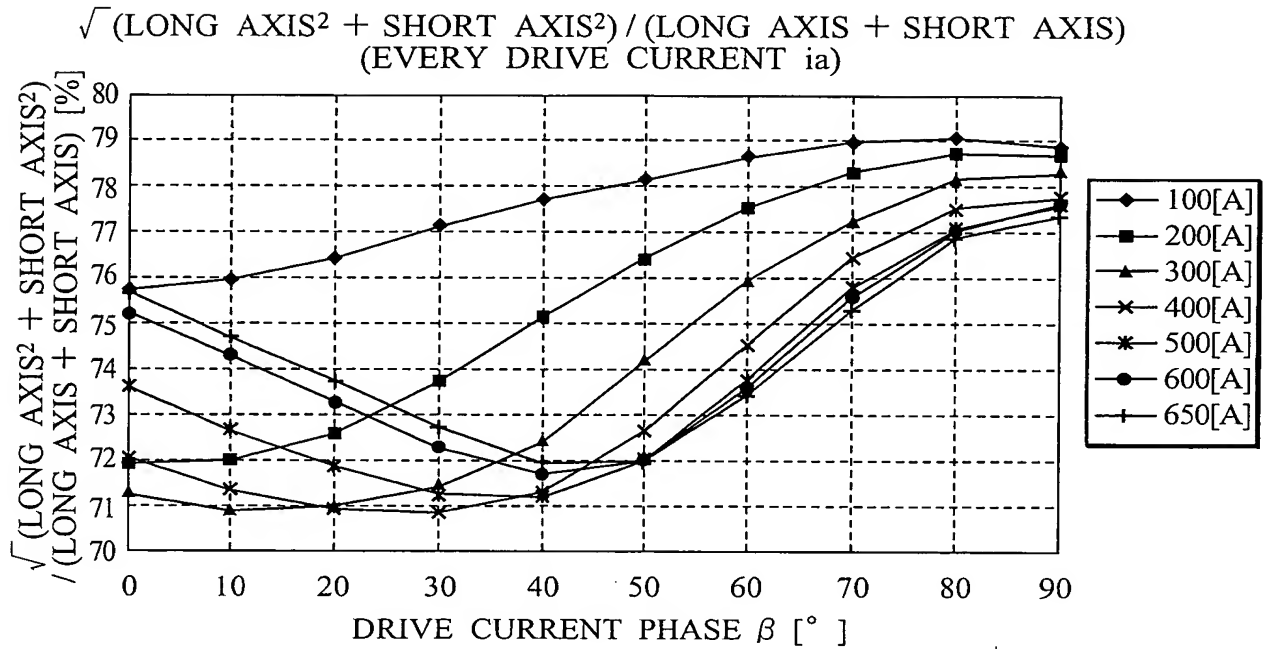


FIG. 21

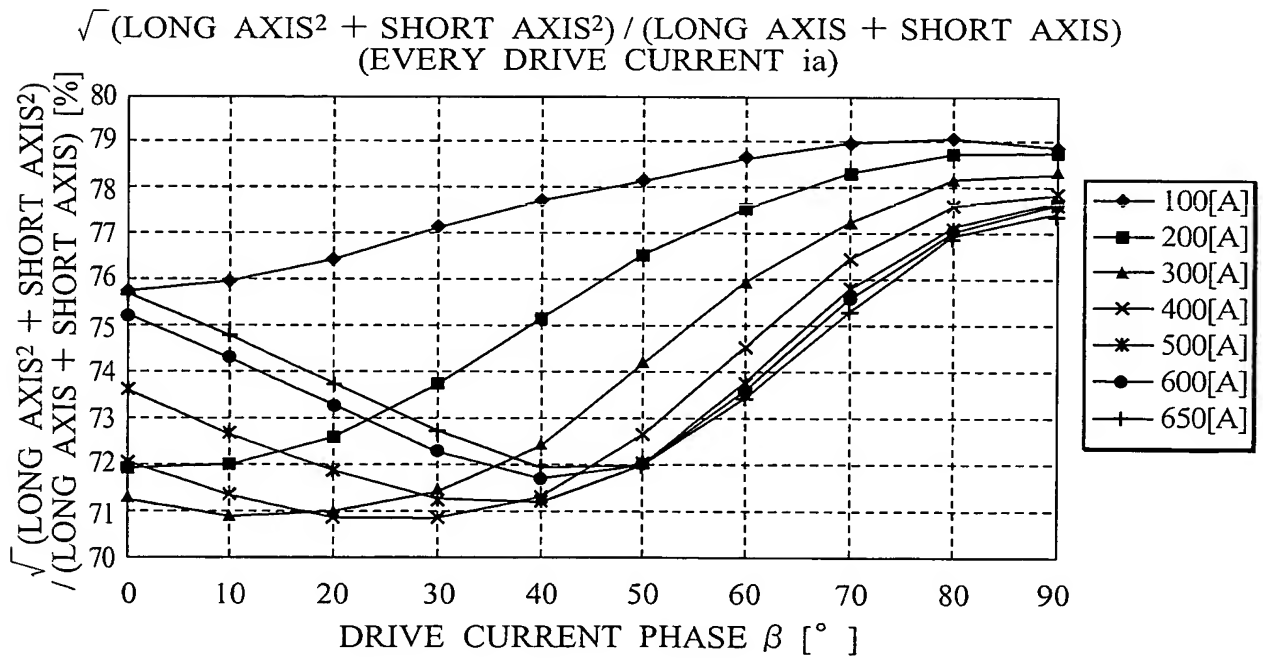


FIG. 22

The diagram illustrates a control system for a motor, organized into several functional blocks and interconnected by signal lines. The components and their interconnections are as follows:

- Input Signals:**
 - TARGET TORQUE** (input to block 10)
 - 3-PHASE CURRENTS (FROM CURRENT SENSOR)** (input to block 11)
- Block 10: CURRENT/FEATURE TARGET GENERATING UNIT**
 - Outputs **TARGET IN d-q AXES CURRENT** (to block 12) and **TARGET 20'** (to block 17).
- Block 11: d-q AXES CONVERTING UNIT**
 - Inputs: **3-PHASE CURRENTS** and **PHASE ANGLE θ** (from block 13).
 - Output: **d-q AXES CURRENT** (to block 12).
- Block 12: CURRENT CONTROL UNIT (CURRENT/VOLTAGE CONVERSION)**
 - Inputs: **TARGET IN d-q AXES CURRENT** and **d-q AXES CURRENT**.
 - Output: **d-q AXES VOLTAGE COMMAND** (to block 13).
- Block 13: 3-PHASE CONVERTING UNIT**
 - Inputs: **d-q AXES VOLTAGE COMMAND** and **PHASE ANGLE θ** .
 - Output: **3-PHASE VOLTAGE COMMAND** (to block 14).
- Block 14: HIGH-FREQUENCY ROTATING VOLTAGE GENERATING UNIT**
 - Input: **3-PHASE VOLTAGE COMMAND**.
 - Output: **3-PHASE VOLTAGE COMMAND** (to the summing junction).
- Summing Junction:**
 - Inputs: **3-PHASE VOLTAGE COMMAND** (from block 13) and **3-PHASE VOLTAGE COMMAND** (from block 14).
 - Output: **PWM COMMAND** (to block 15).
- Block 15: PWM COMMAND GENERATING UNIT**
 - Input: **PWM COMMAND** (from the summing junction).
 - Output: **PWM COMMAND (to INVERTER CIRCUIT)**.
- Feedback and Control Path:**
 - 3-PHASE VOLTAGE COMMAND** (from block 13) is also fed back to the **d-AXIS DETECTING UNIT** (block 18).
 - Block 17: 3/2-PHASE CONVERTING UNIT**
 - Inputs: **TARGET 20'** and **PHASE ANGLE θ** .
 - Output: **$\alpha-\beta$ AXES CURRENT** (to block 18).
 - Block 18: d-AXIS DETECTING UNIT**
 - Inputs: **$\alpha-\beta$ AXES CURRENT** and **3-PHASE VOLTAGE COMMAND**.
 - Output: **ANGULAR SPEED ω'** (to block 21).
 - Block 21: INTEGRATION**
 - Input: **ANGULAR SPEED ω'** .
 - Output: **PHASE ANGLE θ** (to block 11).
 - Block 19: FEATURE CALCULATING UNIT**
 - Inputs: **TARGET 20'** and **ANGULAR SPEED ω'** .
 - Output: **FEATURE VALUE** (to block 20).
 - Block 20: FEATURE CONTROL UNIT**
 - Inputs: **FEATURE VALUE** and **ANGULAR SPEED ω'** .
 - Output: **IN FEATURE** (to block 10).

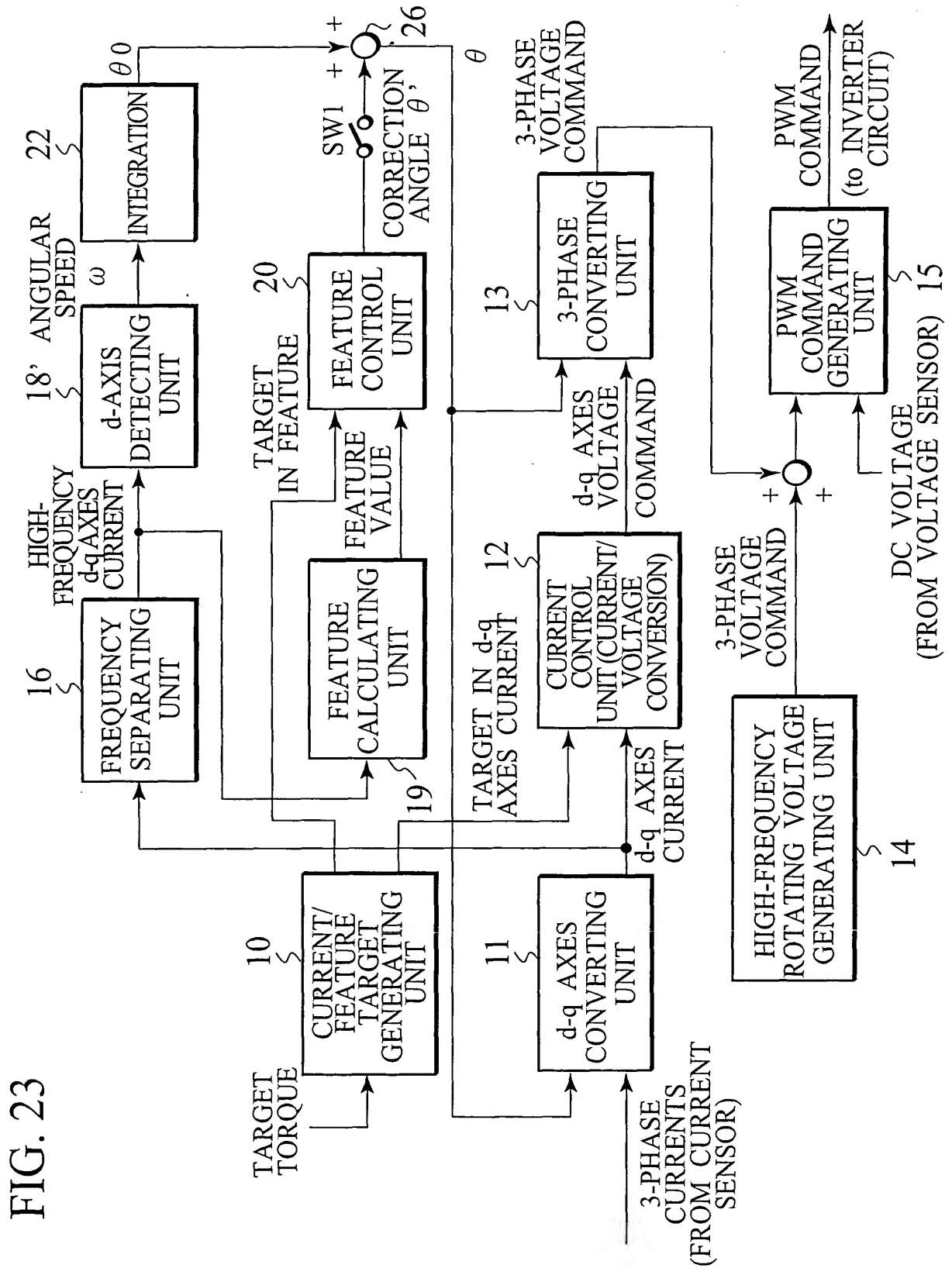
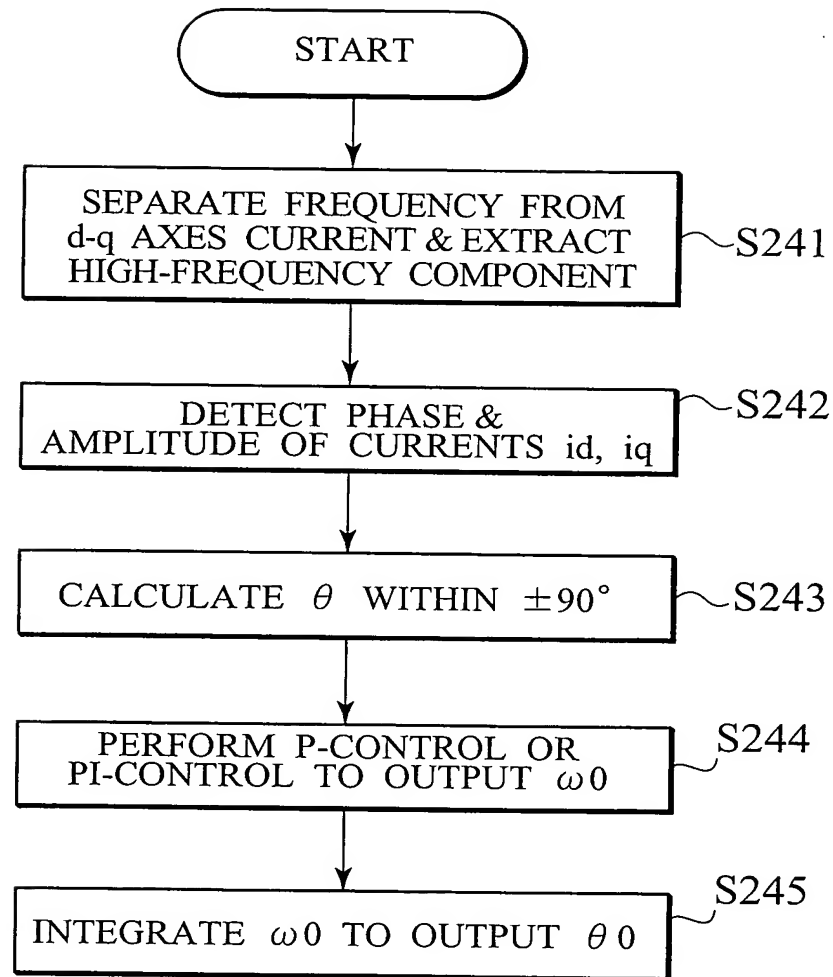


FIG. 24



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FIG. 25

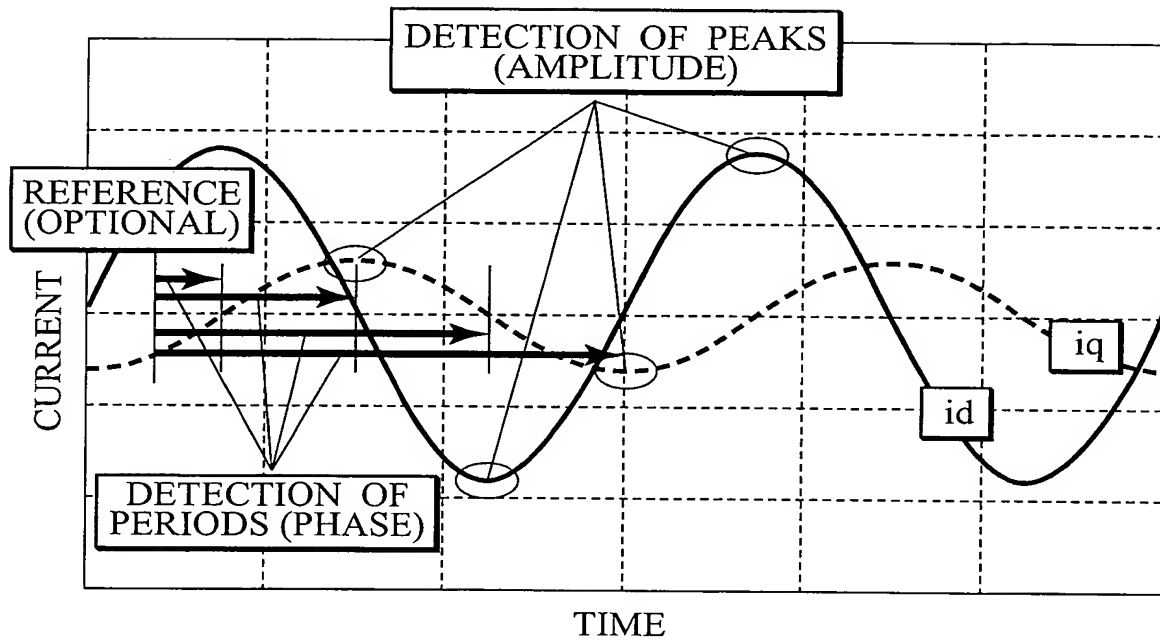


FIG. 26

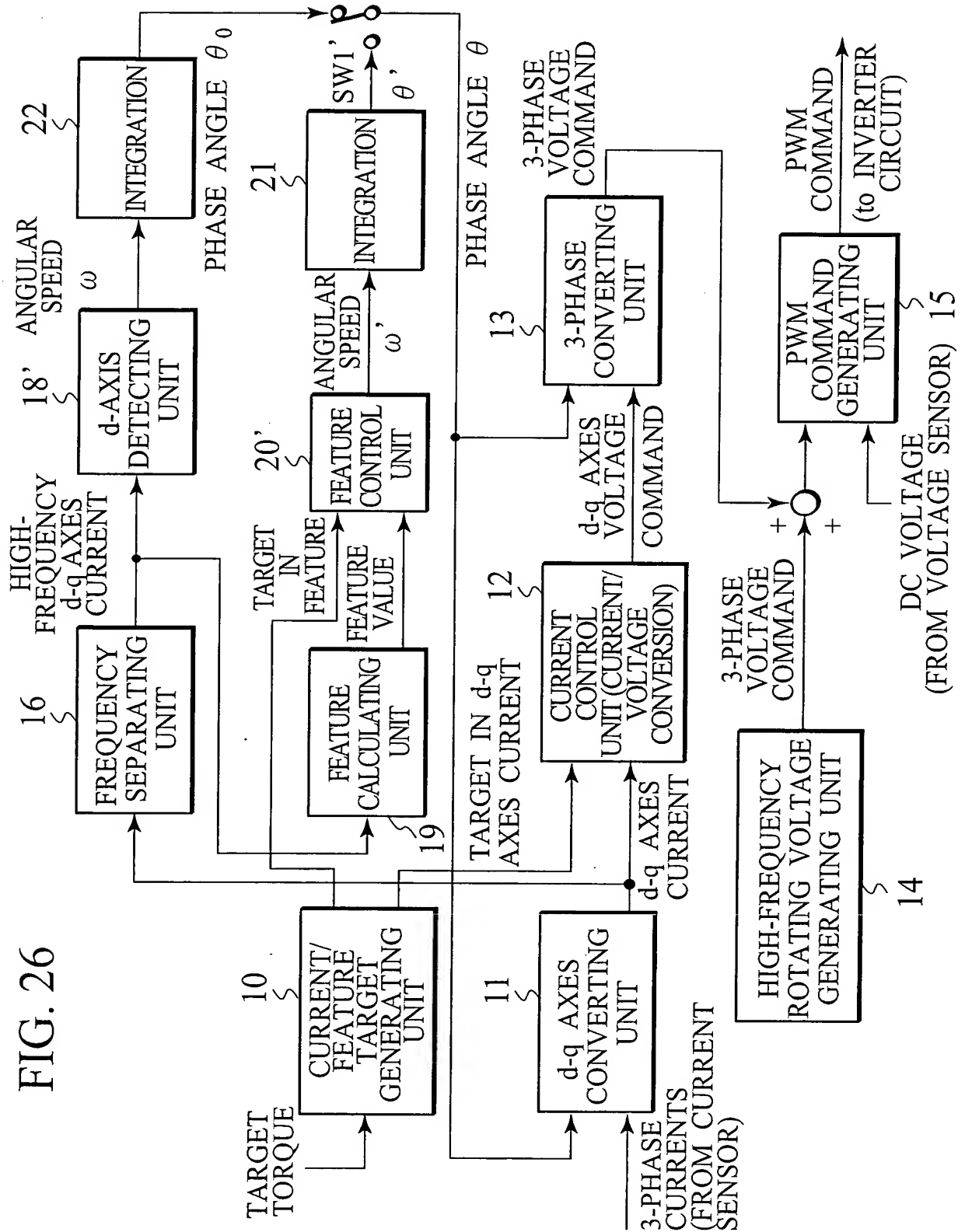
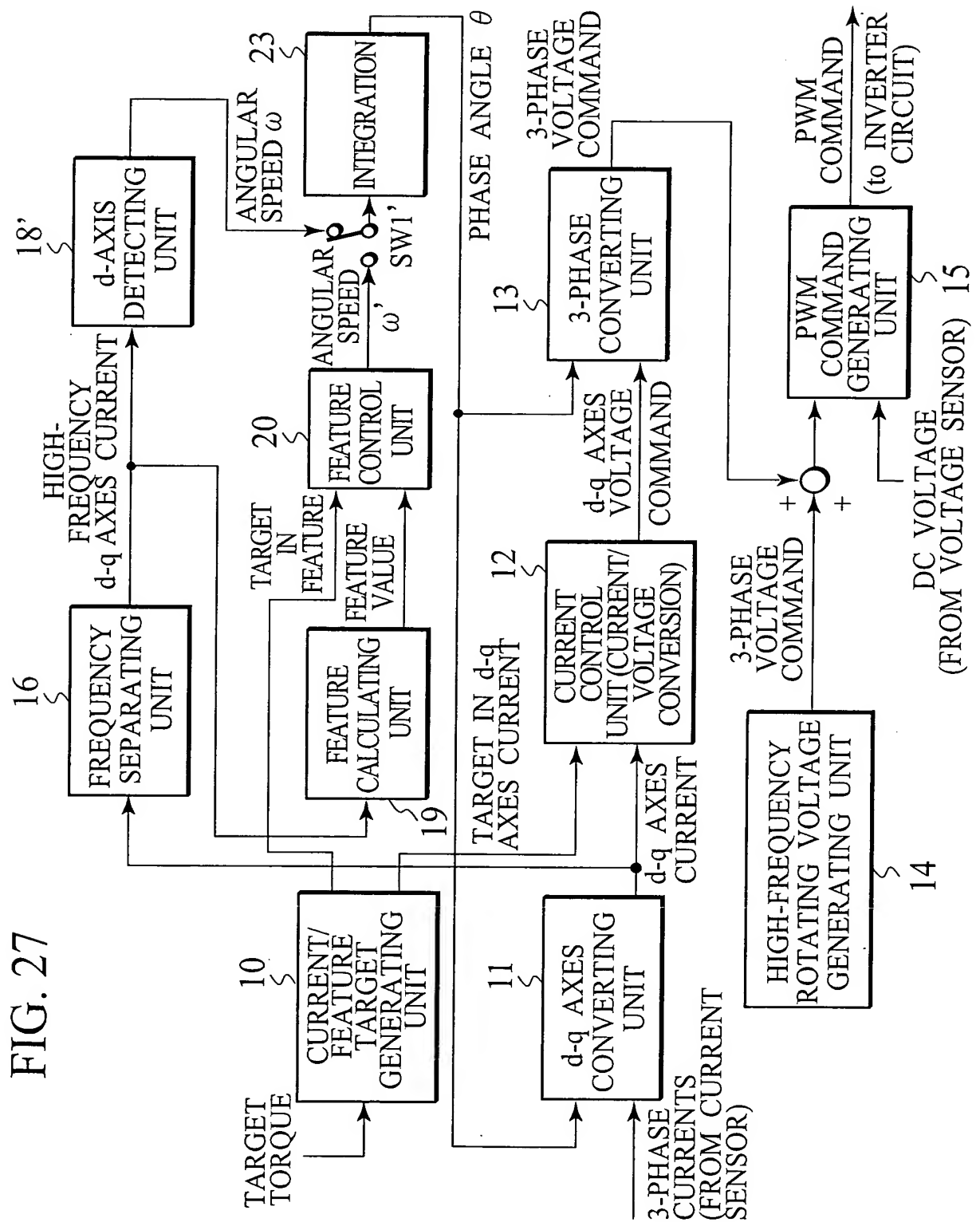


FIG. 27



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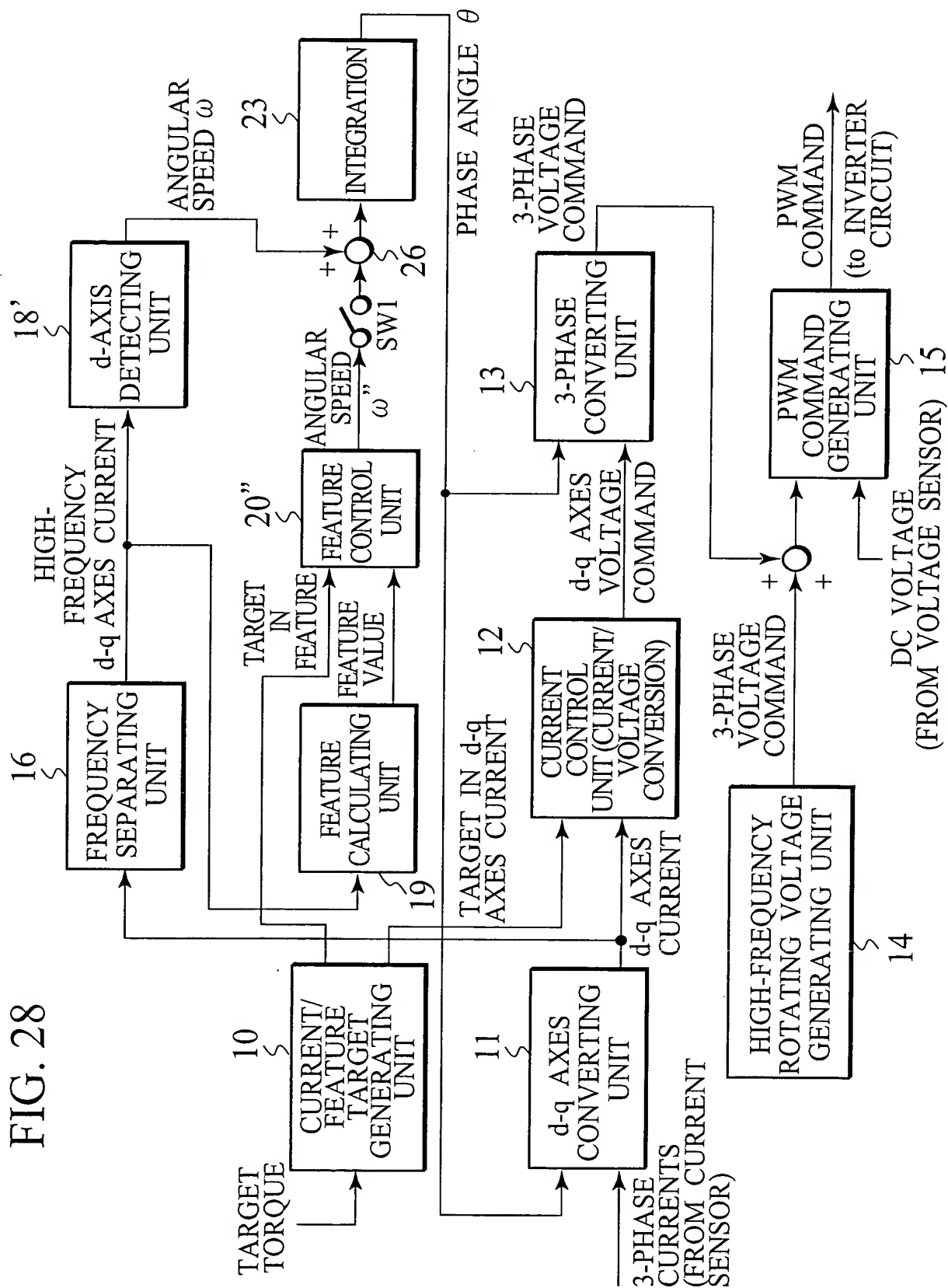


FIG. 29

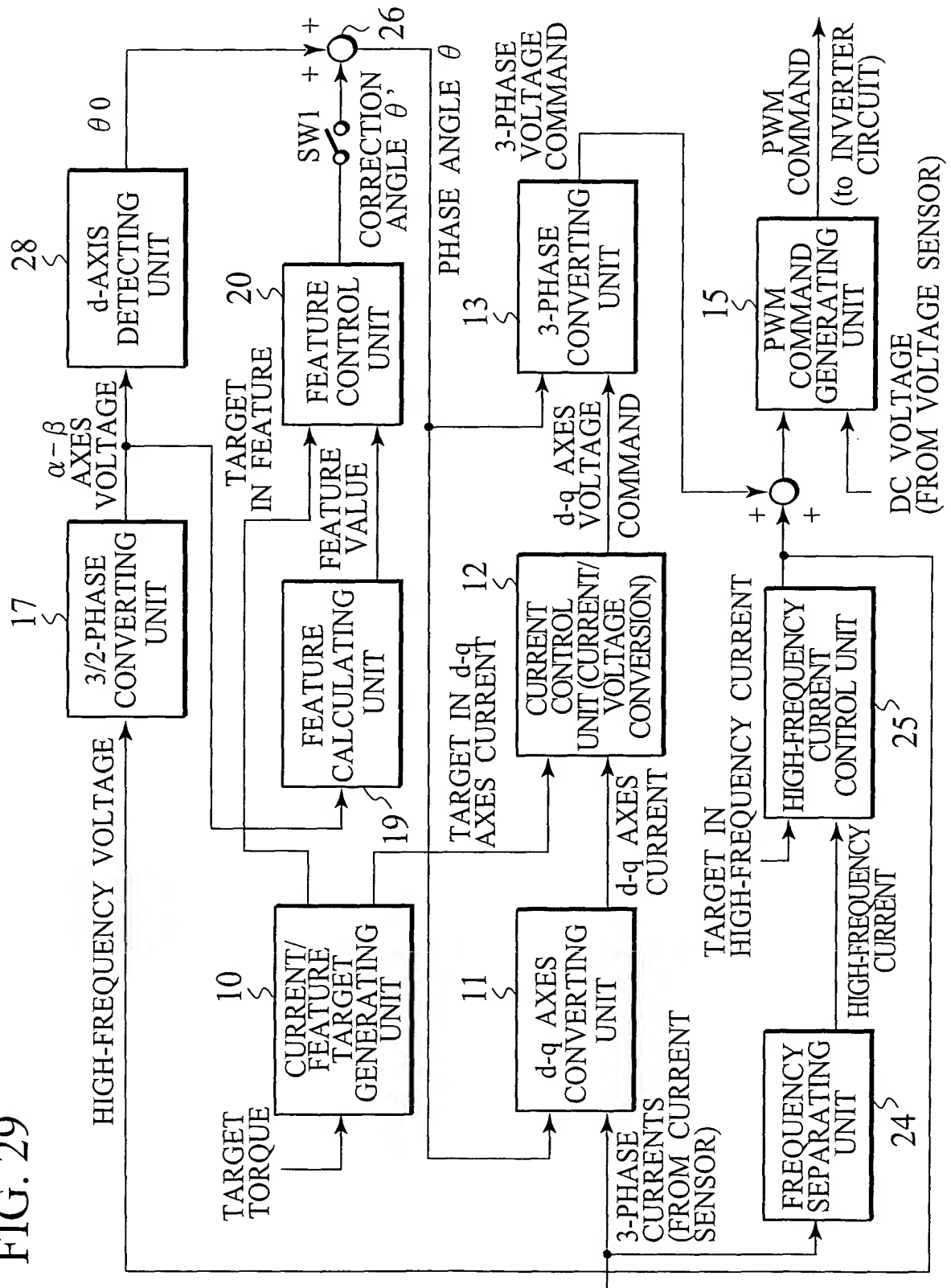


FIG. 30A

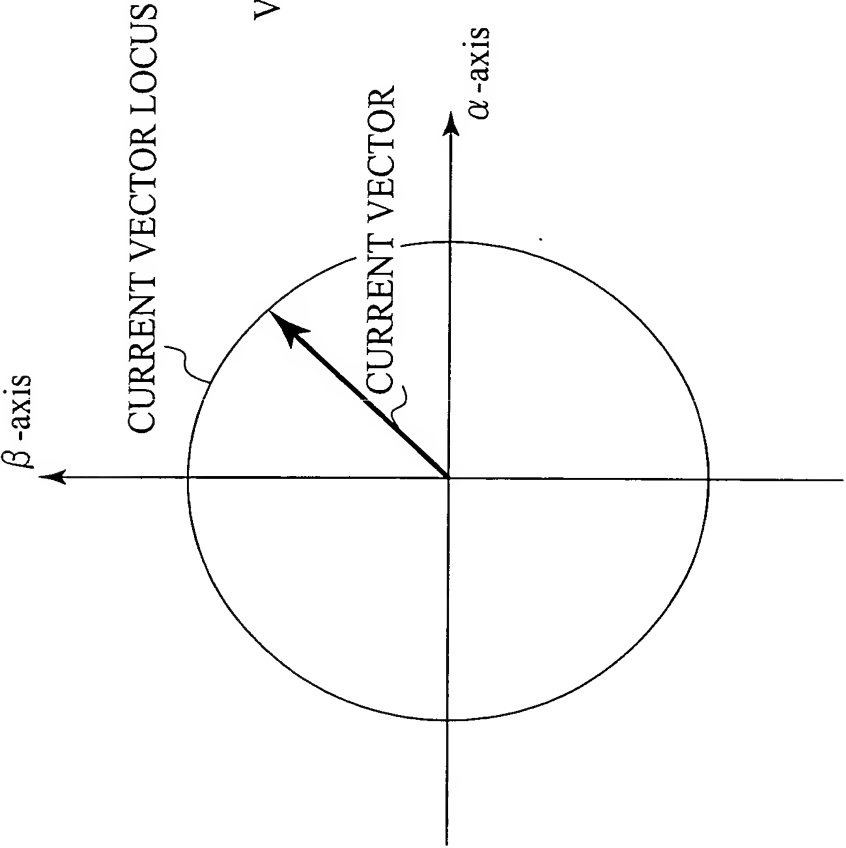
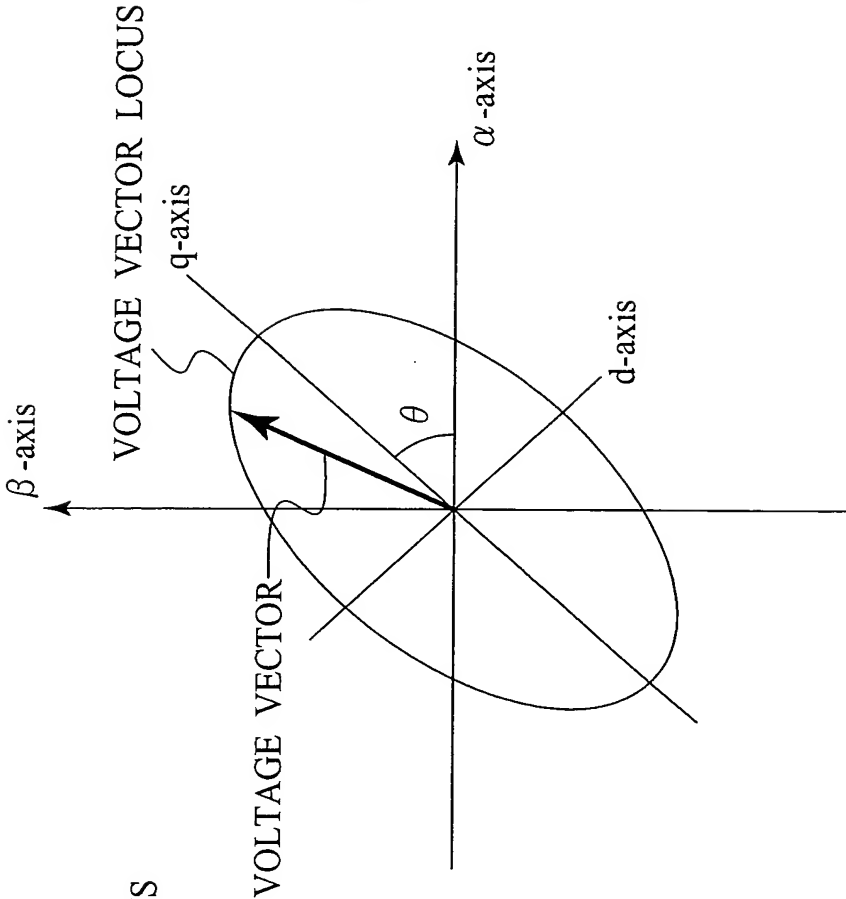
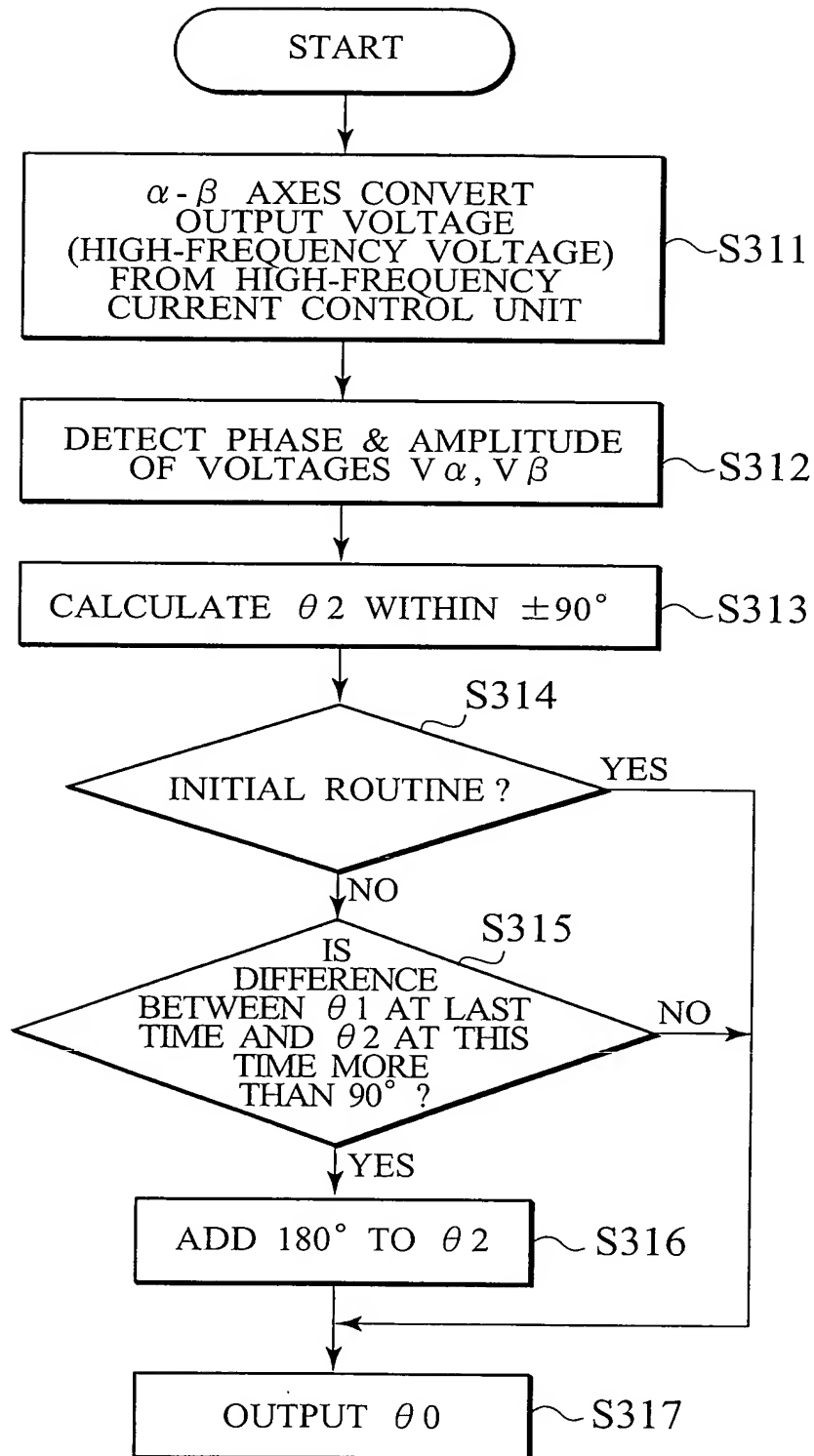


FIG. 30B



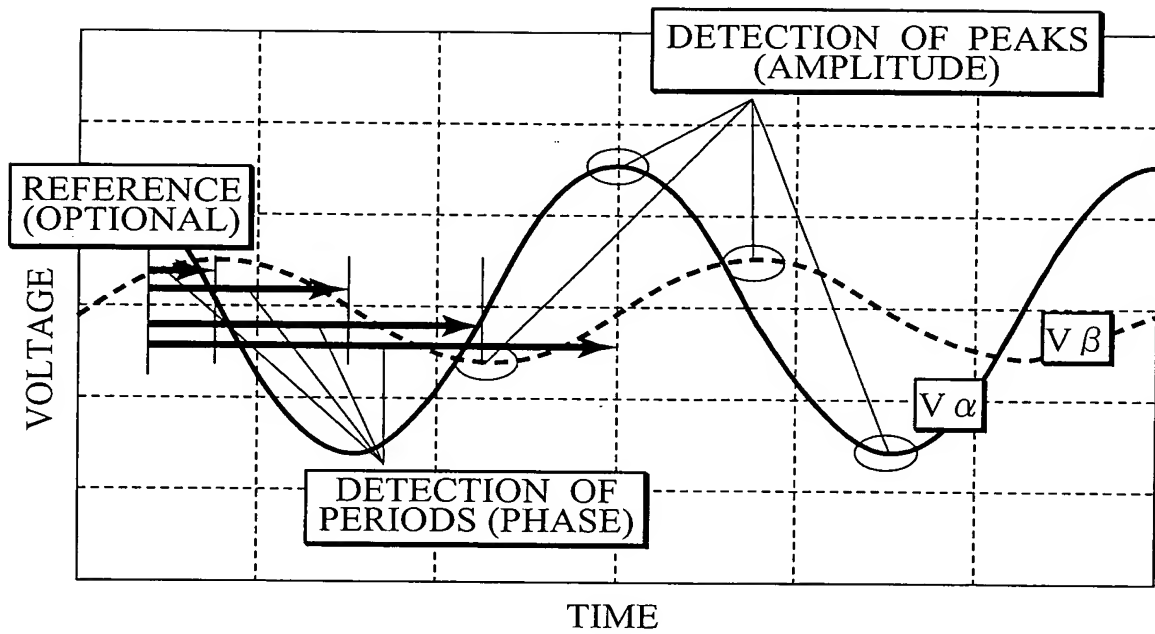
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FIG. 31



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FIG. 32



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FIG. 33

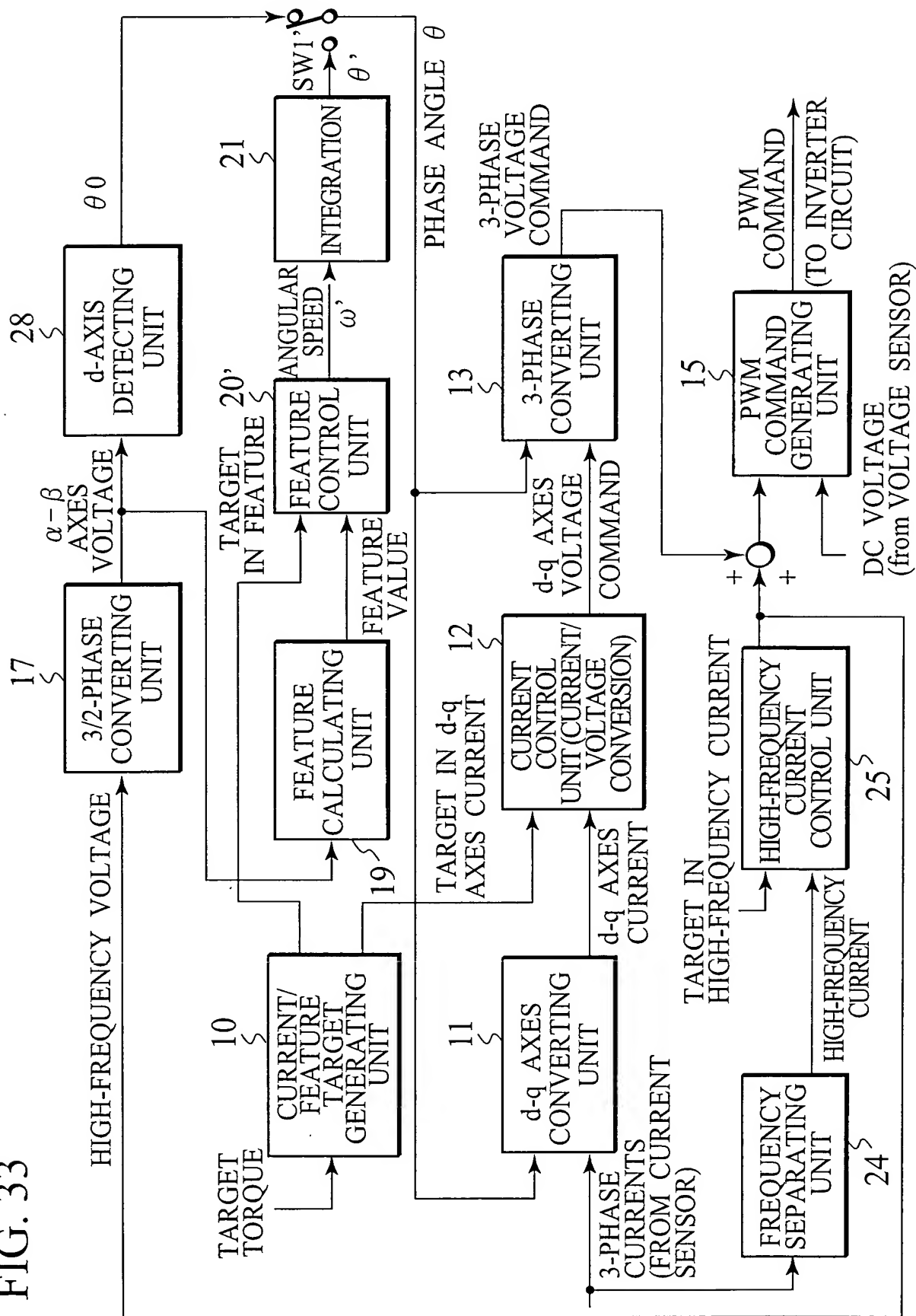
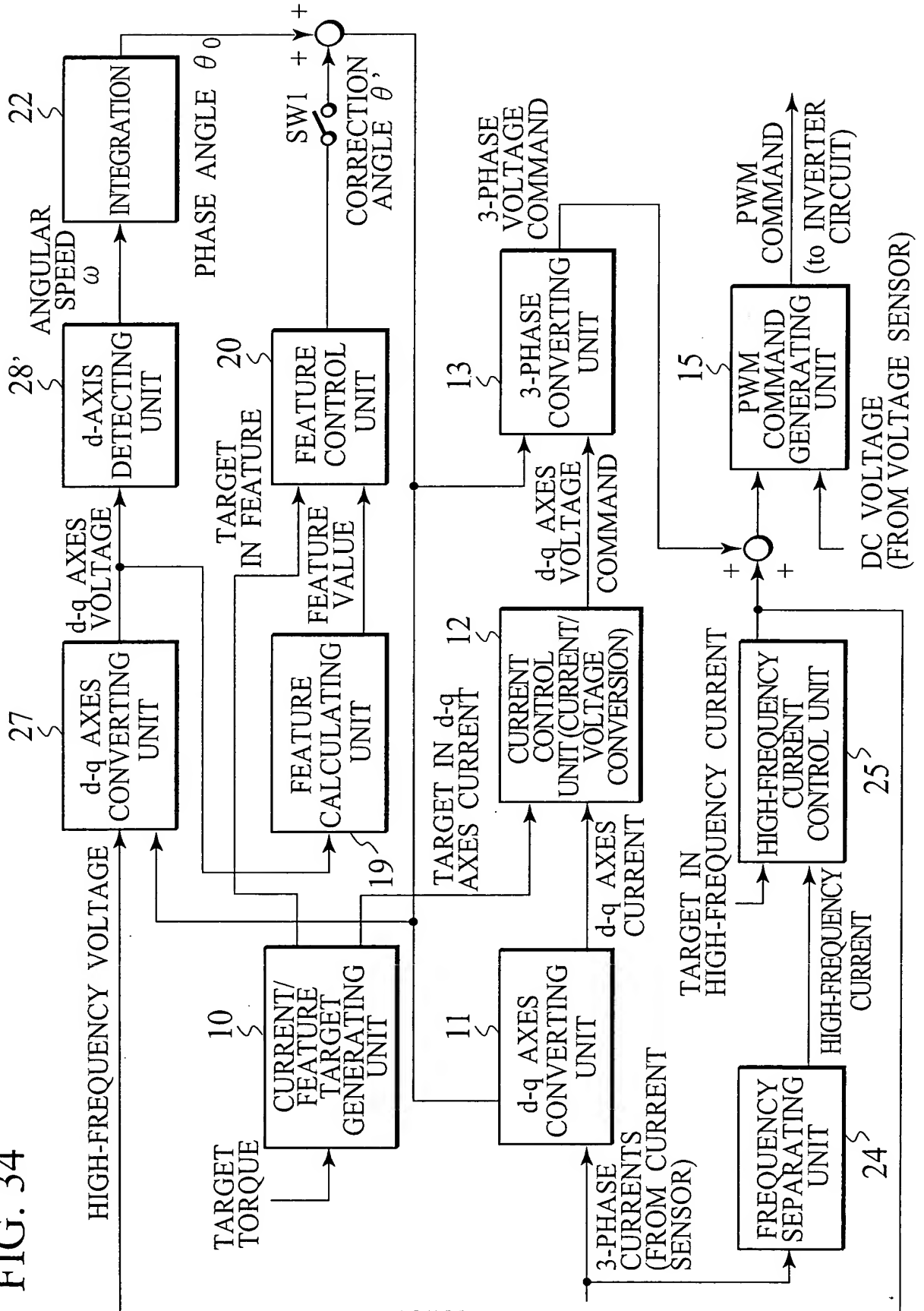
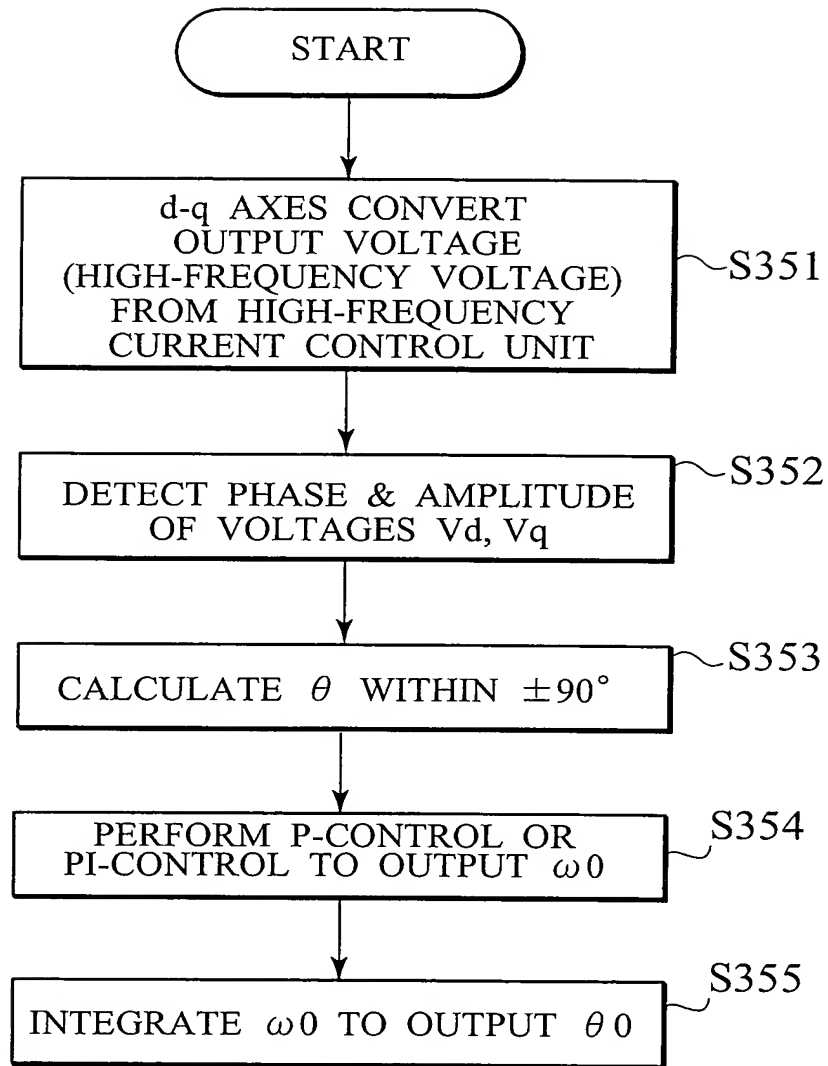


FIG. 34



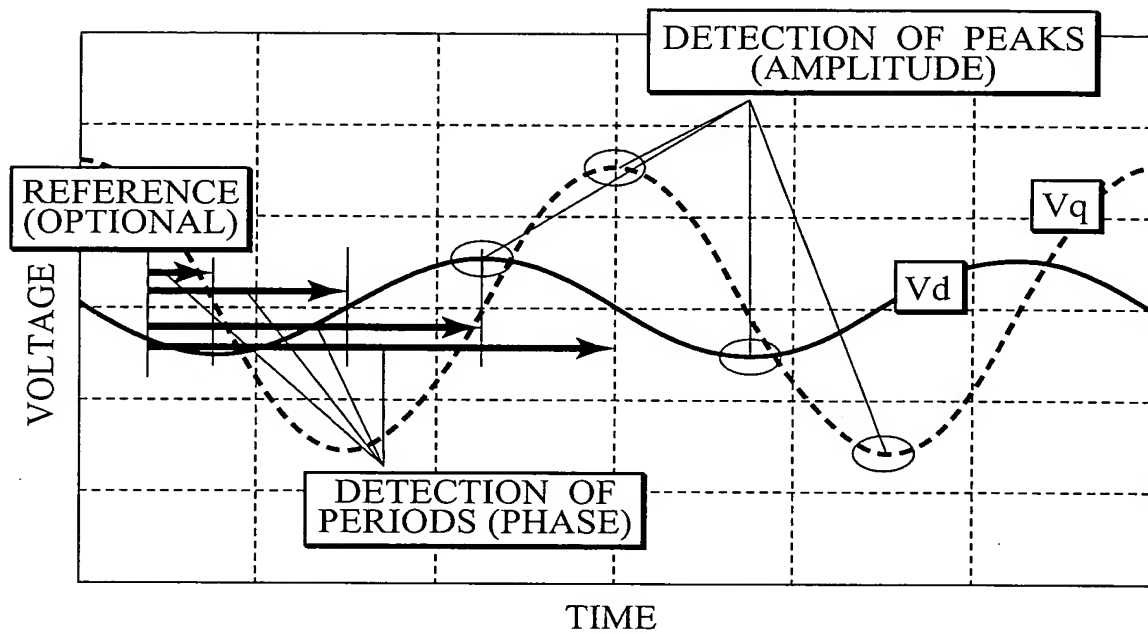
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FIG. 35



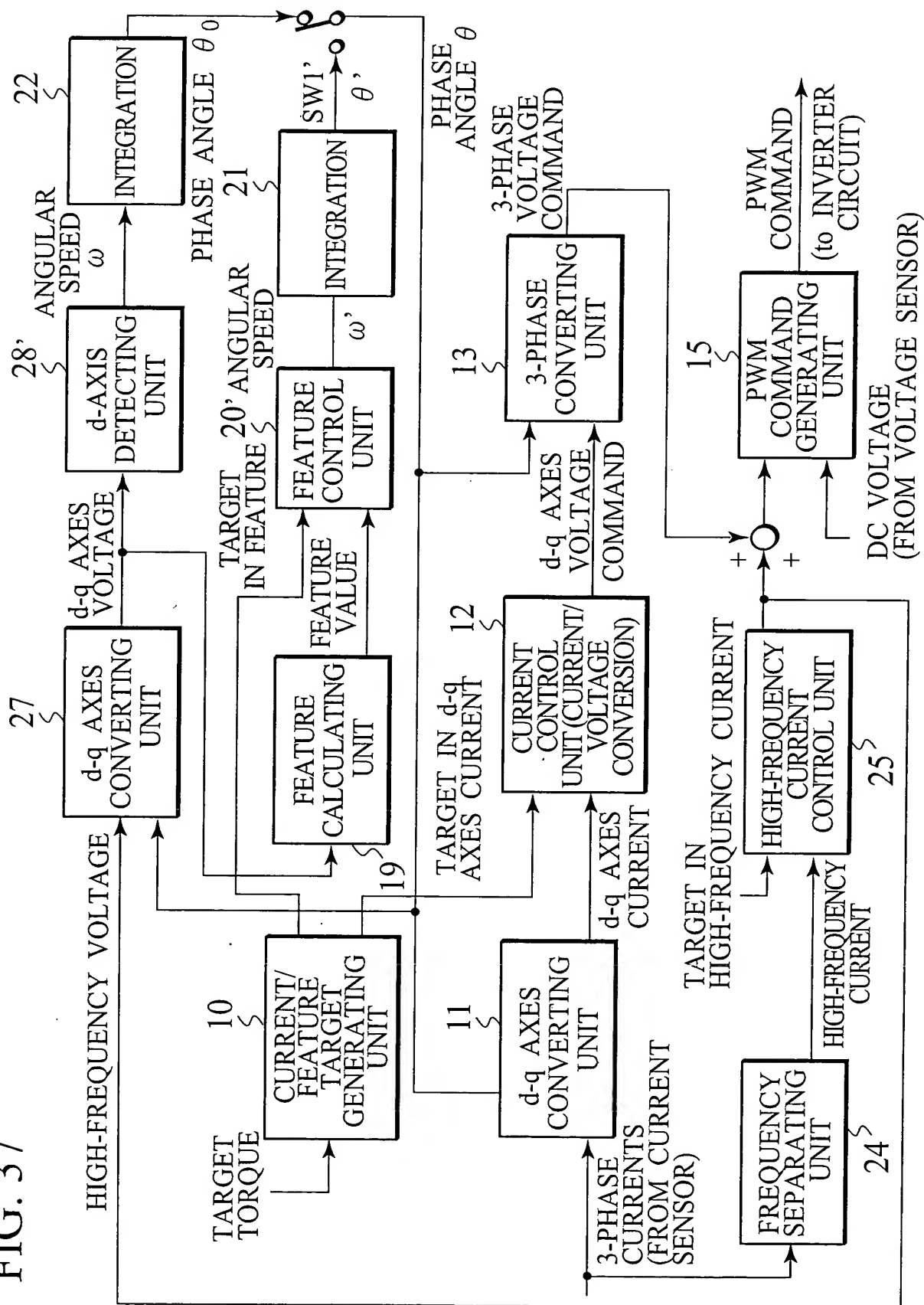
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FIG. 36



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FIG. 37



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FIG. 38

